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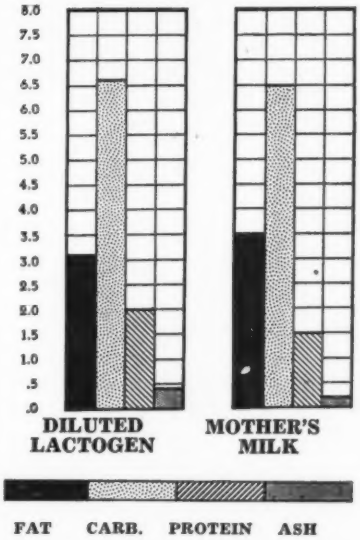

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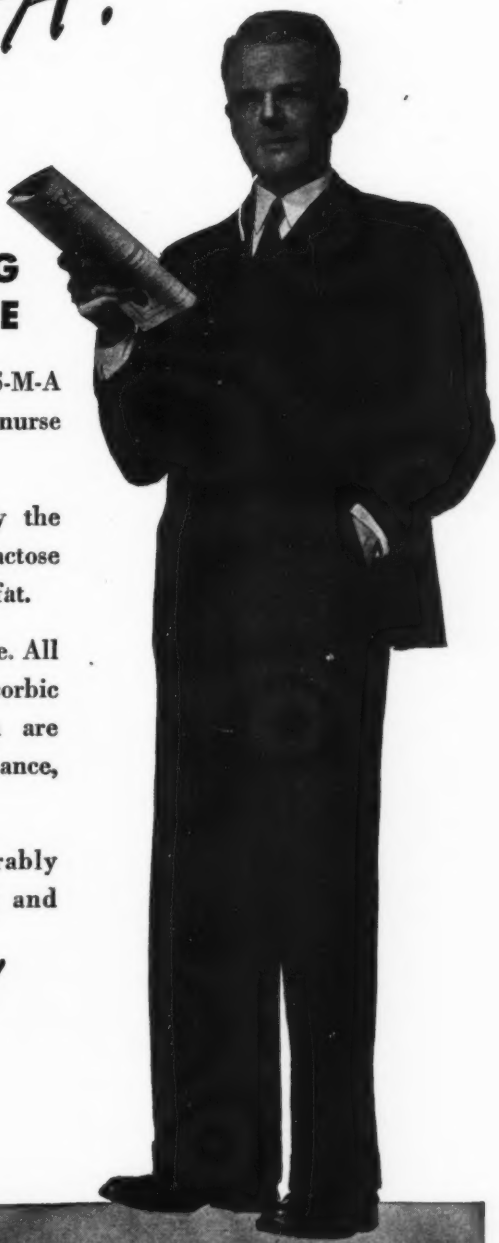

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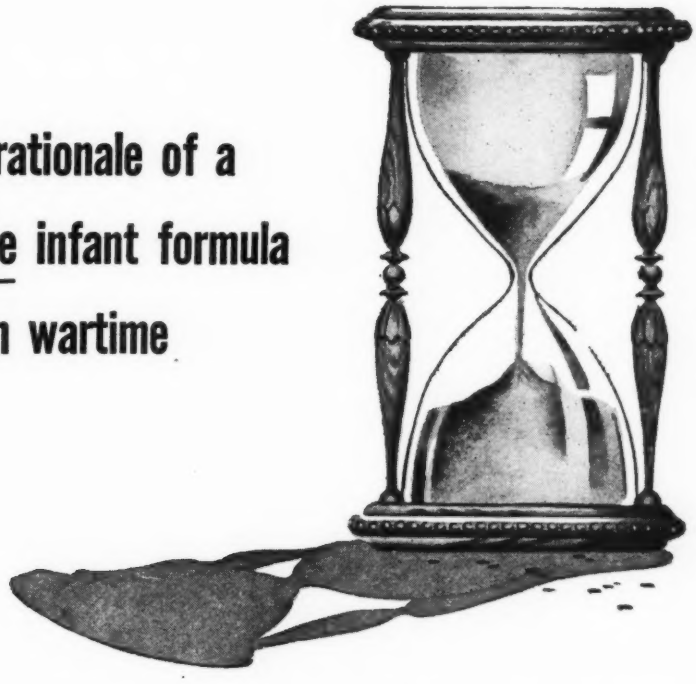

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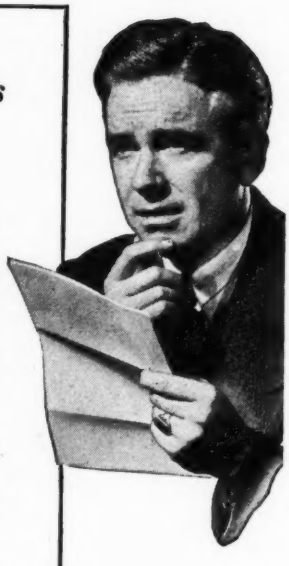

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** The Military Surgeon, Vol. 89, No. 1, p. 5, July, 1941*
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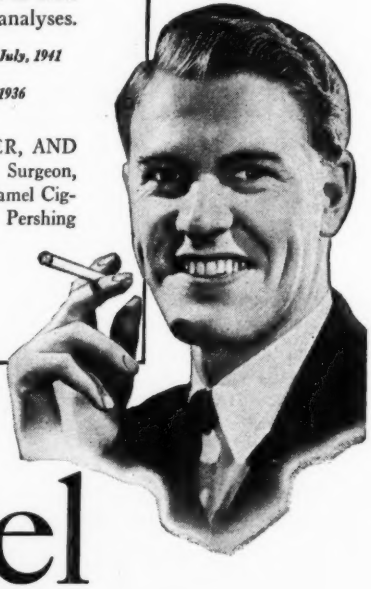

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THE JOURNAL OF THE FLORIDA MEDICAL ASSOCIATION
PUBLISHED MONTHLY

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SOME MEDICAL PROBLEMS OF FLIGHT

MAJOR NATHAN S. RUBIN, M. C.
PENSACOLA

Man, with the same imperfect physical equipment he employs under conditions of life on the earth's crust, has by use of the airplane entered among tremendous forces in the environment of the upper air. As pilot or air traveler, he has placed himself within an instrument capable of creating particular conditions of stress which have never before been experienced by the human organism and which can be injurious to it.

According to the *Civil Aeronautics Journal*, there were 564 aircraft and 2,500 registered non-military pilots in Florida on Jan. 1, 1942. The Civil Aeronautics Commission of the United States Department of Commerce reported that for the first eleven months of 1941, the seventeen scheduled air lines operating in continental United States carried three and three-quarter million passengers an average of 400 miles each. With mass production of airplanes and with the tremendously expanding pilot-training program of the military services, the certain outgrowth of the present war will be more civilian flying and air travel as cheap and matter-of-course as today's travel by train or automobile.

As the development of aviation progresses and as airplanes become more powerful, fly faster and fly higher, the medical profession must keep pace with the special medical problems which have arisen. This paper will be limited to consideration of the physiologic, potentially pathologic, effects on the gas-filled body cavities, the effects of tissue anoxia, and accelerations of the body in flight effects, which are problems of aviation medicine of moment also to physicians from whom air travelers will inquire how flying can affect them and why.

The physical elements influencing the human organism most during flight in the modern airplane are concerned with vibration, noise, ventilation, temperature and high altitude flying. Except for high altitude flying, the skill of technical engineering has brought these factors well within the zone of passenger comfort. But the physiologic and psychologic impairments resulting from ascent, descent and altitude continue as today's medical problems of aviation.

The human organism has developed mainly on the earth's crust and near to sea level. Yet generations of men have become adapted to life at altitudes of from 8,000 to 14,000 feet in the Peruvian Andes, the Alps and the Himalayas.[1, 2] Nevertheless, transporting the human body by airplane to similar altitudes, even for short periods of time and despite the capacity of the human body to adjust to sudden changes in the physical environment, is attended by pronounced effects on various organic functions caused directly or indirectly by changes in atmospheric (barometric) pressure and by acceleration.

The airplane is not an automobile, but a ship which navigates the atmosphere. At sea level the atmosphere is weighted down and compressed by the miles of air above it, but in the upper air, the component gases of the atmosphere, mainly nitrogen and oxygen, being relieved of the weight as the barometric pressure falls with increasing altitude, become increased in volume and thin. These external physical effects do not compress or distort the body, but the gas-filled cavities of the body, principally the nasal accessory sinuses, the middle ear and portions of the intestinal tract, become subject to an expanding force. In addition, thin air, lacking a sufficiency of available oxygen, may create tissue anoxia, while the rapid accelerations produced by the flight itself may cause disordered orientation. As a consequence, certain physiologic, potentially pathologic, disturbances occur, which will now be discussed.

First consideration is given to the nasal accessory sinuses, namely, the frontal, maxillary, anterior and posterior ethmoidal, and sphenoidal sinuses, in a group. They need no other histologic or anatomic description here than that they are essentially spaces in the skull lined by mucous membrane and containing atmospheric air. This air, like gases anywhere, is governed by the same physical laws and expands with the decrease in barometric pressure which occurs with ascent (fig. 1). Except that the sinuses communicate with the nasal cavity through natural openings, they may be considered as inelastic spaces now become subject to pressure. This pressure[3] can

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Wing Surgeon, 51st Troop Carrier Wing.

Read before the Sixty-Ninth Annual Meeting of the Florida Medical Association, held in Hollywood, April 13, 14 and 15, 1942.

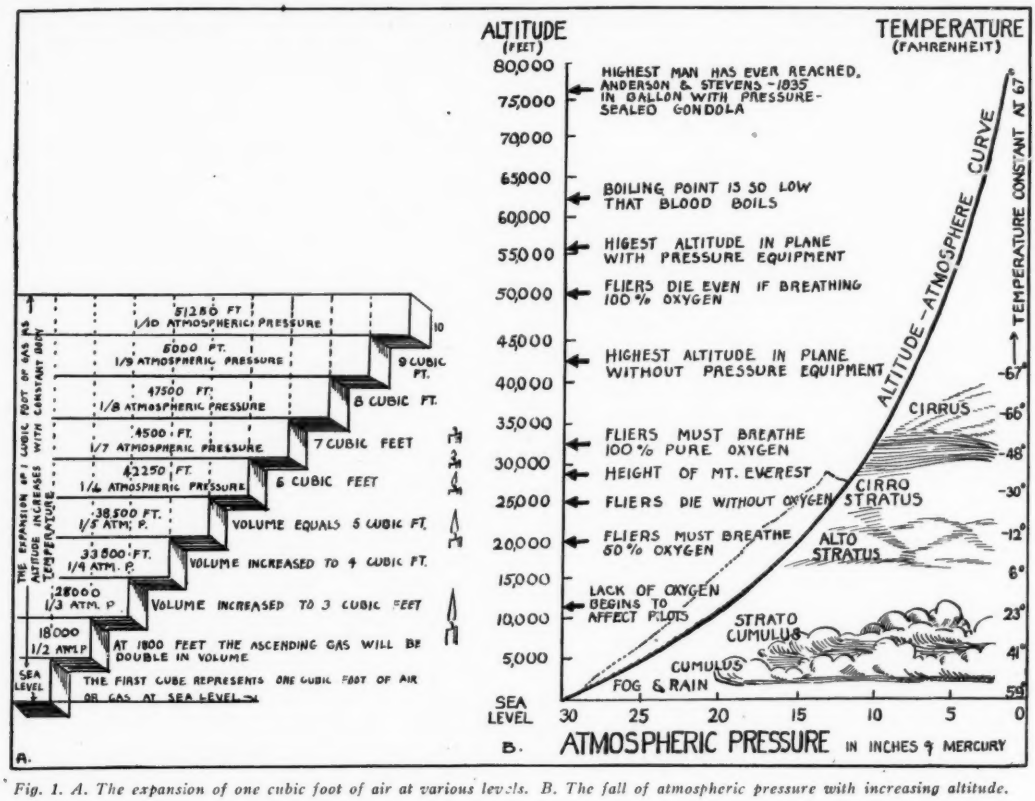

Fig. 1. A. The expansion of one cubic foot of air at various levels. B. The fall of atmospheric pressure with increasing altitude.

be reduced to 3 pounds (1.3 Kg.) per square inch as at an altitude of 38,000 feet, or increased to 240 pounds (109 Kg.) per square inch as at 500 feet under water, without demonstrable physiologic effects provided equalization of pressure can occur freely in these air spaces of the skull. But if these air spaces are occluded or their openings obstructed, variations of even 1 or 2 pounds (0.5 or 1 Kg.) of pressure, when occurring with rapid altitudinal changes, will elicit a severe pain over and outlining the involved sinus area, and be accompanied by congestion, edema and hemorrhage in the affected tissues.

When sinus disease with exudate, purulent or otherwise, already exists, the disease will become aggravated. This exudate, as the atmospheric pressure outside the sinus becomes less than that inside it, as occurs in ascent, is forced outward and will escape from the sinus or will lie over the sinus opening. With descent, the pressure becomes negative. A cupping action occurs in the sinus, and the bacteria-containing fluid is forced back into it. In this way, further burden and insult are added to the already vulnerable and congested sinus mucosa.

Simularly, when the opening of the sinus is obstructed by swollen tissues or by polyps, these changes may completely obstruct the opening. In ascent, air in the sinus will flow outward, and no symptoms will occur until descent. Then, the negative pressure may suck the redundant tissue into the sinus opening to close it completely, and as the pressure inside the cavity decreases, equilibrium becomes established by drawing blood and serum from the sinus mucosa.[4] Consequently, when altitudinal changes are rapid, with accompanying differential pressures, the swelling of tissue and production of fluid may become enough to give severe pain and the picture of acute sinus disease. Obviously, persons with nasal disease, head colds, polyps or other forms of nasal obstructions, should not fly or travel by air unless these conditions are alleviated before flight. Since conditions of atmosphere vary to greater degree near sea level, all these effects become especially prominent and distracting when a plane approaches land, and a pilot needs all his faculties for a safe landing.

Of all the organs that suffer because of man's flying, the ear, particularly the middle ear, is

one of the most susceptible. The middle ear presents a problem in flight somewhat similar to that of the sinuses and is the origin of the difficulty most frequently experienced occupationally by aviators, and by air passengers. The middle ear, too, except for the tympanic membrane, is essentially an inelastic air-filled space. From it the air regularly escapes, or is replenished by way of the eustachian tube during swallowing, yawning and similar physiologic acts. Since the deleterious effects of air travel occur largely because of the structure and function of this same eustachian tube, a brief anatomic review is presented.

The eustachian tube or canal, a slitlike potential tube extending from the middle ear to the nasopharynx, is formed of bone, cartilage and fibrous tissue, and has a lining of ciliated mucous membrane. Its functions are to drain and to ventilate the middle ear. During ascent to high altitude, the expanding air in the cavity of the middle ear, acting like all gases under pressure when the pressure is lessened, forces open the eustachian tube and passes through it into the nasopharynx and outside air, thereby relieving pressure within the middle ear. This change occurs in a series of spurts; the developing pressure in the middle ear does not force the air out through the eustachian tube at the onset, but becomes perceptible as an annoying feeling of fulness which also affects hearing by imparting a distant sound and a decreased intensity. There is also an increasing bulging of the drum. This continues during 500 feet of ascent by which time, in normal cases, an excess pressure (approximately 15 millimeters of mercury) has been created, which is sufficient to force air out through the eustachian tube, thereby relieving the pressure in the tympanic cavity and the accompanying symptoms, while the drum membrane snaps back into normal position. This procedure is repeated during each 500 feet of ascent and each time is accompanied by a feeling of fulness as the pressure builds up, and by a click as the pressure is relieved and the drum snaps back into place.

Beyond this annoyance, a climbing airplane causes no difficulty in the middle ear unless there is partial or total stenosis of the tube. Then the pressure required to force it open will be increased and will vary with the degree of stenosis. The tension becomes relieved only over a period of time instead of instantly, or a residual pressure may continue in the middle ear after the tube has closed. If the tube cannot be opened at all and ventilation of the middle ear is not accomplished, pressure within the middle ear will continue to rise, and the drum will continue to bulge and be traumatized. Such insults repeated may produce a permanent conduction type unilateral or bilateral deafness. A pressure of 15 to 30 millimeters of mercury will increase the discomfort and is accompanied by mild tinnitus, vertigo and pain. Pressure in the middle ear above 30 millimeters of mercury will cause increasing pain, tinnitus, and vertigo that will finally become unendurable unless the eustachian tube can be opened voluntarily, an effort normally required only in descent.

In descent of an airplane, the atmospheric pressure increases, and the gas pressure in the middle ear becomes negative. Nevertheless, except that the drum membrane becomes sucked in instead of bulging, the symptoms are like those already named. Further, the pressure cannot be relieved mechanically through its own force acting on the eustachian tube because the valvelike action occurs only one way, from the middle ear to the nasopharynx. Only voluntary contraction of the tube's dilator muscle permits air to enter the middle ear and prevents formation of a vacuum. This is accomplished by a descent not faster than a thousand feet per minute, by swallowing or yawning, by singing or shouting, by tensing the muscles of the neck, by chewing gum or sipping fluids, or by closing the mouth and pinching the nose shut while blowing through it, thereby forcing air into the middle ear. There is, normally, no difficulty in accomplishing this unless the negative pressure in the middle ear has been allowed to build up and the ear is thus caused to become trapped. This pressure cannot then be relieved by muscular action, but only by a return to the original higher altitude, to be followed by conscious ventilation of the middle ear every thousand feet during a slow descent.

It is repeated that there is no difficulty normally. No matter whether the pressure in the middle ear is positive or negative, mechanical or voluntary opening of the eustachian tube will immediately relieve all acute symptoms unless there is partial or total stenosis of the tube. Then again comes trouble for it is during descent in aircraft that the greater difficulty and the highest pres-

sure differentials occur. When a negative pressure of 60 millimeters of mercury occurs, the pain is severe as in acute otitis media, the tinnitus becomes great and nausea and vertigo are present; at 80 millimeters of negative pressure, the pain is most severe and radiates to the jaw and cheek; when pressures go even higher, the pain becomes agonizing and deafness is pronounced, finally leading to nausea and vertigo, collapse and shock, and extensive linear rupture of the tympanic membrane with hemorrhage.

From consequences such as these, it is evident that those with partial or total, temporary or permanent, stenosis of the eustachian tube should be warned against flying except under controlled conditions of gradual changes of altitude and not higher than 2,000 feet. Narrowing of this tube is not a textbook rarity. It is seen among those who, as a consequence of an adenoidectomy that went too far afield, have scar tissue about the pharyngeal opening of the eustachian tube. Persons with edentulous mouths or poorly fitting dentures, those with overbite of considerable degree of malocclusion and those with molar teeth worn or lacking all also have a crowding or compression stenosis of the eustachian tube.[5] Stenosis of the eustachian tube of varying degree happens also with coryza, sinusitis, tonsillitis or pharyngitis, nasal obstruction and inflammatory conditions of the eustachian tube and middle ear. Unless stenosis of this tube of any degree is alleviated, flying should be considered a potential source of irritation, and even of permanent damage, to the ear.

Gases in the stomach and intestinal tract, usually residual nitrogen of swallowed air, mixed with gases of fermentation, also obey physical laws and expand with the decrease in atmospheric pressure which occurs with ascent. At high altitude, pilot and passenger alike may have excessive bloating and abdominal distention only partially relieved by the passage of flatus. The expansion of these gases may lead to abdominal discomfort and colic, to pressure on the diaphragm and to interference with breathing and digestion. Those who fly or travel by air do well before flight to avoid gas-producing foods like beans, cabbage and cauliflower, as well as coarse vegetables bulky in cellulose, highly spiced or greasy foods, beer, carbonated drinks, tea or coffee in excess, sweets and alcoholic liquors. All constricting clothing should be loosened; women should take off girdles. Similar considerations also apply to high altitude travel or transport by air of patients with intestinal perforation, with recent abdominal wounds, with peptic ulcer, with strangulated hernia, or with intestinal obstruction.

A most significant and dangerous disturbance that occurs in flight is the physiologic and psychologic impairment that results from the lack at high altitude of available oxygen for the subsistence of the human organism. The function of breathing is to obtain supplies of oxygen for the tissues and to get rid of carbon dioxide. In contrast to provision for reserves of other chemicals that maintain life, such as carbohydrates and calcium, there is no storage of oxygen in the body, except limitedly in the lungs and blood stream where it is expended every forty seconds. Hence, the human economy leads a hand-to-mouth existence as regards its oxygen needs and is dependent on a constant supply from the atmosphere.

The air near the earth consists almost entirely of nitrogen (78 per cent) and oxygen (20.93 per cent) with traces of carbon dioxide (0.04 per cent) and about 1 per cent of the inert gases, argon, neon, krypton and helium, besides a variable amount of water vapor. So far as its gaseous constituents are concerned, the composition of the atmosphere remains almost unaltered up to a height of 38,000 feet. But in ascent above the earth's surface, the pressure of the atmosphere falls so that at any given altitude a given volume of gas increases in volume in relation to the fall of the barometer, and the concentration of gases is reduced (fig. 1). Specifically, at 18,000 feet the total atmospheric pressure and the partial pressure of oxygen are reduced one half while the mass of gas occupies nearly twice the volume it would occupy at sea level, so that a given breath of air at that level would supply only half as much oxygen. As the partial pressure of atmospheric oxygen falls, there is a consequent fall of oxygen pressure in the alveoli of the lungs. Then follows a decrease in the oxygen saturation of the arterial blood together with the development of anoxemia and, finally, of tissue anoxia, which in aviation causes altitude sickness.

Airmen continually exposed to flights at high altitudes build up an increased tolerance to oxygen lack and adjust more readily to the conditions of flight. Nevertheless, during long flights even at 10,000 feet, physical inefficiency, the

commitment of costly errors of judgment and the development of excessive fatigue are apt to occur. The average unacclimatized air traveler[6] conditioned by his physical well-being, or lack of it, by the number of hours of sleep or degree of fatigue previous to flight, and by his emotional adaptation and freedom from worry, also becomes subject to such physical impairments. Some become affected at 8,000 feet, others at 16,000 feet while the average is between. Effects become pronounced at 14,000 to 16,000 feet, and dangerous at 18,000 to 20,000 feet. At 20,000 feet unconsciousness may occur within a few minutes or an hour, at 25,000 feet within thirty seconds to fifteen minutes, at 30,000 feet from thirty seconds to one and one-half minutes, at 35,000 feet from twenty-five to fifty seconds, and at 40,000 feet within fifteen to twenty-five seconds. When the altitude is attained gradually, acclimatization is easier, and the effects may be less serious.

Acute altitude sickness has an insidious onset which, in many, may lead to unconsciousness, with warning symptoms often completely unobserved subjectively. These warnings are frontal headache increasing with altitude, vertigo on moving suddenly or bending over, shortness of breath or irregularity in breathing, alterations in field of vision with greatly reduced ability to see in low illumination and a tendency to lethargy and exhaustion. Objective findings are like those in tissue anoxia from any cause; pulmonary ventilation is increased, and breathing becomes deeper until at 25,000 feet respiratory failure owing to anoxia causes death after twenty to thirty minutes of exposure. The cardiovascular response at first is an increase in cardiac rate, blood pressure and cardiac output, along with an increase in the amount of hemoglobin in the circulation. When anoxia occurs, though there is an absence of physical exertion, the added effects of centrifugal force cause profound changes in distribution of the blood and increase the burden of the heart to maintain adequate circulation. Forty-seven per cent faint as a consequence of circulatory collapse, while the other 53 per cent exhibit failure first of the higher psychic centers.[7] It is interesting that there is a tendency for less extreme rises in pulse rate and less susceptibility to sudden collapse or fainting in older persons, indicating that the circulatory mechanism of adaptation has become more stabilized or less flexible with increasing age.

Psychologic changes, as a consequence of anoxia in those cortical elements of the brain centering the more complex mental functions, closely follow these physiologic alterations. When anoxia is mild, these changes resemble those of mild alcoholic intoxication; an early false sense of well-being, a feeling of exhilaration followed by lethargy and sleepiness, impaired reasoning and judgment, slowed reaction time, greater difficulty in concentrating, attending and thinking clearly, an increased lack of insight which does not permit the flyer to recognize his predicament and his own deficiencies. There is a striking increase in the amount of effort of mind required to accomplish usual tasks, and when such tasks are accomplished they are attended by great fatigue. Profound psychologic effects occur between 20,000 feet and the point at which unconsciousness happens. Deterioration occurs rapidly. There are restriction of activity with loss of neuromuscular control, tremors of the hands and general clumsiness, and there may be twitching, rhythmic movements, or even paralysis.[8] Awareness of the lapse of time is lost together with volitional control, except for a great persistence in attempting to carry out an assignment. Explosive emotional outbursts, increased irritability or loss of temper and self control, or laughter without cause, occur to evidence alterations in temperament or emotional stability. Anoxia beyond this degree brings unconsciousness, and death, if exposure is long enough. Supplementary oxygen should be used at all altitudes over 15,000 feet and in all flights over 10,000 feet if the flight is prolonged. In flights in which preservation of night vision is paramount, oxygen should be breathed from the moment of the take-off.[9]

Air travelers with pronounced respiratory or cardiac defects are especially susceptible to these effects. It has been said that the average cardiac patient who can walk can also fly, but the altitude should be restricted so as to avoid any serious effects during or after flight. Patients with disease of the heart who have little cardiac reserve should avoid air travel except in extreme emergency.

Airsickness, not to be confused with altitude sickness, is an effect of rapid accelerations of the body, both linear vertical motions and rotary motions, in aircraft flight. It is characterized by nausea, even vomiting, instinctive fear, pallor,

sweating, vertigo and prostration. Its etiology is still a matter of argument, but evidence suggests it may be a special type of vertigo, induced by physiologic and psychologic mechanisms, that occurs when conflicting sensory impressions from two or more of the organs of equilibrium reach consciousness. As long as the pilot or the air passenger is able to have a visual reference to the terrain below, he will not suffer from vertigo due to accelerations. When the airplane banks, turns, noses up or down, or makes sudden changes in vertical position due to bumpy air, the semicircular canals and otolithic apparatus transmit the changing position in space. As long as flying is close to the ground in good visibility, the visual mechanism records similar changes of the position in space with reference to the ground. When, however, the pilot is flying blind as in dense clouds, or when the passenger similarly cannot, or makes no attempt to, keep oriented by fixing the gaze on definite objects on the ground, the only visual reference is the inside of the plane itself. Since the body has moved with the plane, the eyes record no changes in the position in space, inasmuch as the inside of the plane has not changed position at all in relation to the body as far as can be seen. Hence the two sets of data do not coincide, and vertigo due to a disordered orientation soon arises. When this happens, it can almost immediately be overcome if visual reference to the ground is made for even a brief moment, so that the person's visual and labyrinthine stimuli can agree. The vertigo and chain of symptoms which arise are unpleasant, but to the pilot they are not only unpleasant but dangerous, unless he has been taught to watch his instruments and to ignore the sensations arising from the labyrinth.

This has been a hedge-hopping survey of the subject, and much has been untouched and unsaid. Nevertheless, it may arouse some degree of awareness of the problems of aviation medicine. Man, when he put on wings and attempted to penetrate a region in which he is poorly fitted to survive, looked to medicine to solve the difficulties.

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DISCUSSION

COMMANDER GUY FISH, Miami: I will try to emphasize a few points in connection with this timely and interesting paper. One point the Major did not bring out is that nonsymptomatic cavities of the teeth are often first detected due to the expansion of the gas within the cavity. Concerning the sinuses, with descent, the pressure becomes negative. A cupping action in the sinus presses fluid filled with bacteria back into the sinus and is blamed for accidents at the present time. It seems more logical to me that air will get into a cavity more readily than will fluid.

I think that one point was omitted. Chewing gum to equalize pressure in the middle ear was mentioned. That would only be practicable on short infrequent flights, and also it could not be practiced while wearing a mask. I don't own any Wrigley stock; so I am against the practice of chewing gum. So much air is swallowed while chewing gum that it is impracticable from a military standpoint when long flights are required.

There is one point which is often brought up, that passengers returning from night flights above 9,000 feet often complain of retardation and reduction of light adaptation. They are not noticed around 5,000 feet and on return to the ground. Below 9,000 feet there is very little trouble. This difficulty may be the result of decrease in oxygen above that level.

An early objective symptom of airsickness and one readily seen is cyanosis of the nasal beds.

Another point which I think should be brought out is that there is impairment of hearing while a person is flying. This may be the cause of pilots not being able to follow the beam. They depend upon the beam a great deal, and it has often been thought that in a few cases disastrous results may have been due to the fact that there was a lack or loss of hearing and that the pilots were unable to hear and follow the beam.

Another interesting little sidelight is air embolism. Air embolism may occur in flight above 25,000 feet. One will get symptoms similar to those occurring in caisson disease, such as headache, pain in joints, arms and legs, and disturbance of vision. These usually clear up when the men return to the ground and are only a matter of interest because instructors or pilots may ask questions as to why they had these pains at that particular height.

I have observed many persons coming in complaining of pain in the ears. I should like to mention just a few things not covered by the Major. His is a hard paper to discuss because it is mostly facts that he presented. Patients will come in complaining of pain in the ear. The external canal has something to do with that complaint for I have observed in many cases that wax has accumulated and become firm and that it may be forced up against the drum. In some cases this wax, on becoming free for some reason and being mixed with water, sets up irritation and a chronic eczematous condition of the external canal with a very red membrane and considerable pain. If there is no wax in the external canal, then pain is usually caused by an accumulation of serum in the middle ear causing definite redness and evidence of inflammation.

One more point Dr. Jones asked me about this morning. A friend of his wrote him that during calisthenics he found after turning slowing and then changing his

position that dizziness developed. This is noticed frequently during exercise. It is due to the fact that when turning slowly over a period of time the fluid in the semicircular canal is set in motion. On changing position of the semicircular canal or on stopping movement there will be a sense of dizziness. This is overcome in ballet dancing by a quick snap of the head on turning. This is a point well worth remembering, and one that is easily explained to patients.

Dr. M. A. Lischkoff, Pensacola: Major Rubin has demonstrated the 1942 model to which I can add nothing; but, being a pioneer in aviation medicine, I might be able to tell you something about the 1917 model from which some of these facts have evolved.

Before this country entered the war with Germany in 1917, a group of otologists were invited to the office of the Surgeon General in Washington to discuss the problem of the flier, who was destined to play an important role. We were told the German aviation force had a separate medical group investigating its special problems and that this group had done much to distinguish those who have special physical qualifications for flying. At the conference special stress was put on the labyrinth; vertigo and nystagmus were of prime importance.

Up to that time the flyer was not selected because of his peculiar fitness for flying; it was simply a question of whether he "had the nerve." At one time circumstances made it necessary to place men in the aviation service who were all worn out by the more trying work of the infantry or field artillery. The viewpoint at that time was: "This man is no longer fit for ground fighting; therefore, he will do for the air service." This led to the belief that the flyer must be a superman.

The aviator took a special examination. He was turned in a Bárány chair. Occasionally the ears were douched with cold water to register nystagmus or vertigo. Depth perception was recorded, and an attempt at reproducing conditions of altitude was made, such as tank examinations when the oxygen was slowly withdrawn and the temperature reduced. The first instrument of value developed for this special examination was the Ruggles orientator.

Many of the pioneers deserve a great deal of credit, and they include such men as Jones, Fisher, Wilmer, Lyman, Lancaster and others. Today there is the same problem of selecting men, but the plane they pilot is a 1942 model capable of doing things of which we hardly dared to dream.

Dr. Rubin (concluding): I have had two special privileges here, the first in being permitted to present the paper, and the second in having had it discussed by Commander Fish. Many may not be aware of the fact that a Commander in the Navy is equivalent to a Lieutenant Colonel in the Army. To me, it is a noteworthy distinction to have a senior officer discuss this paper.

In regard to some of the remarks made, all of which were pertinent, I should like to say that I could not cover the whole subject because of lack of time. I had to leave out air embolism and other phases, such as the neuropsychiatric aspects and fatigue. Indeed, it was only through the kind indulgence of the chairman, Dr. White, that I could cover as much of the subject as I did.

When I prepared this paper, I had expected to be out of the military service and to appear as a civilian, considering the subject from the civilian rather than the military viewpoint.

Those whose practice deals with the ear, nose and throat know particularly that it is hard to swallow on command, or when the act is a conscious one. It is often necessary to give a patient water to sip in order to get him to swallow at the precise point of an ear inflation. So my associates and I tell the air traveler to chew gum. We feel that may prevent consequences in the ear more serious than those that may happen in the intestinal tract as a result of swallowing air.

I want also to thank Dr. Lischkoff for his contribution and glance into the early years of aviation medicine. I think that all should be grateful that aviation medicine has advanced just as the modern airplane has advanced over the crates that were used in his day.

Thank you very much.

SHOCK

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Since shock plays such a large role in war time medicine, a careful review of the recent literature on the subject is apropos at this time. Failure of the circulation may result either from a weakness of the heart itself or from an insufficiency of the circulating blood volume. The former is called myocardial insufficiency or congestive failure, and the latter, peripheral circulatory failure.

Whenever the blood flow to the tissues becomes inadequate in the presence of a heart capable of sustaining a normal blood flow, peripheral circulatory failure is present. Most observers classify peripheral circulatory failure into two types, depending upon the rapidity of its development and the length of time it lasts. Stead[1] and others have suggested the term "primary shock" or "collapse" for the sudden and short-lived peripheral circulatory failure, and "shock" or "secondary shock" for the more prolonged failure. While the two conditions may overlap, it is with the latter condition that this paper is concerned.

Blalock[2a] classified shock as (1) hematogenic, due to actual loss of fluid from the vascular system; (2) neurogenic, due to dilatation of the blood vessels; and (3) vasogenic, due to actual injury of the capillaries and vessels. Freeman,[3] on the other hand, defined shock not as a clinical condition but as "a process characterized by progressive loss of circulatory blood volume brought about by tissue anoxia resulting from inadequate circulation." Harkins[4] defined it as "a progressive vaso-constrictive olegemic anoxia."

The syndrome of shock is characterized clinically by reactions of depression (sometimes with apathy and other times with anxiety), pallor, occasional cyanosis, feeble rapid low volume pulse, faint cardiac tones often with gallop rhythm, cold clammy skin, subnormal temperature, shallow and rapid respirations often interspersed with sighing, thirst, vomiting, bluish red

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mottling of the skin, diminished reflexes, dilated and sluggish pupils, scanty urine with low specific gravity or even anuria, elevation of the nonprotein nitrogen of the blood, acidosis, hyperglycemia and a progressively declining blood pressure. The face is ashen in color, anxious in expression, with eyes sunken and surrounded by bluish rings, the typical hippocratic facies. All these signs or any combination of them may be present, depending upon the severity of the shock.

The picture of shock must not be confused with the picture of circulatory failure of cardiac origin, since the treatment is in many instances diametrically opposed. Cardiac failure is characterized by venous congestion, pulmonary edema, peripheral edema, dyspnea or orthopnea, hepatic congestion and cardiac hypertrophy. None of these conditions is present in the state of shock. Digitalis has an important place in the treatment of cardiac failure, but is harmful in the treatment of shock and should not be used.

Until a few years ago shock was recognized only by the surgeons as an effect of accidental or surgical trauma, but today it is known that it may be produced in a great many other ways. Some of the well known conditions that may produce this syndrome[4,5,6,7] are:

1. Accidental or surgical trauma.
2. External or internal hemorrhage; the latter may be produced by erosion of blood vessels in such diseases as peptic ulcer, aneurysm, varicosity and tuberculosis, resulting in the accumulation of blood in the tissues and body cavities.
3. Acidosis, associated with diabetic coma and other conditions.
4. Addison's disease.
5. Severe burns, produced by the sun or other physical agent.
6. Severe cold.
7. Irradiation sickness.
8. Serum sickness.
9. Profound anemia.
10. Heat stroke.
11. Capillary poisons, such as histamine, peptone and anaphylactic agents.
12. Severe sepsis, as in generalized peritonitis, acute pancreatitis, cholera, pneumonia, influenza and typhoid.
13. Dehydration, from vomiting, diarrhea and other causes.
14. Poisoning, caused by barbiturates, arsenic, mercury, war gases, gold chloride, carbon monoxide, oxalic acid and snake venom.
15. Vascular occlusive conditions, such as coronary thrombosis, pulmonary embolism and embolism of other larger arteries.
16. Trauma without hemorrhage or ruptured tissues, such as may be caused by severe blows to the abdomen or testicle.
17. Hyperventilation.
18. Spinal anesthesia.
19. Allergic crises.
20. Pain, emotional stress, exposure to cold, physical and nervous fatigue may all be contributory factors.

All the enumerated causes of the syndrome of shock have one common factor, a discrepancy between the blood volume and the capacity of the vascular system. It may be produced by a decrease in the circulating blood volume or by an increase in the vascular capacity,[8a, c] or both. This discrepancy is recognized as the essential feature of shock. The easiest to understand is the decrease in blood volume caused by the loss of blood, or by dehydration resulting from excessive sweating, polyuria, vomiting, or diarrhea. Decreased blood volume is produced by the loss of plasma as a result of burns, pulmonary edema, peritonitis and trauma with tissue infiltration, and by generalized loss of plasma due to capillary damage, an extremely important factor in shock. Discrepancy may also be caused by an increase in the vascular capacity due to the sudden loss of vasomotor tone. This phenomenon occurs in association with fainting, spinal anesthesia, and widespread capillary dilation and injury from bacterial toxins or histamine.

The most important cause of the discrepancy is the increased vascular capacity which follows capillary endothelial damage. Moon[8a] claimed this to be the explanation of shock. Under the influence of various noxae the capillaries dilate, lose their permeability and become congested with blood. Thus a portion of blood is drawn out of circulation as a sponge absorbs water. The degree of shock is in direct proportion to the amount of blood segregated in the capillaries.

Whether the blood volume is reduced by loss of blood, by dehydration, by loss of plasma, or by withdrawal of the blood from circulation, the results are essentially the same and consist of decreased circulating volume of blood leading to reduced volume flow, tissue anoxia and widespread capillary injury. While hemorrhage may

lead to shock and give similar clinical findings, this condition has a different pathologic physiology and should be considered as a separate entity in order properly to understand shock. The mechanism of shock is well summarized by Moon[8b] as follows:

> Endothelium is delicately sensitive to lack of oxygen, to metabolic products, cytoplasmic substance, bacterial toxins and to a wide variety of chemicals and drugs. When affected by any such substances, the endothelium becomes relaxed, atonic and abnormally permeable to blood plasma. The sequestration of blood in dilated capillaries reduces the effective blood volume, and the leakage of plasma into tissue spaces lowers the total blood volume. This creates a disparity between the volume of blood and the volume-capacity of the vascular stream bed. This disparity, if not compensated, causes circulatory deficiency.
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> Compensation is accomplished through responses activated probably by impulses from the carotid sinus. Activity of the sympathoadrenal system causes constriction of peripheral arteries, the discharge of reservoir blood from the spleen into the systemic circulation and stimulation of the heart by the adrenal medullary hormone. So long as the mechanism of compensation is effective there is no marked decline in the blood pressure but the latter is maintained at the expense of volume flow which is reduced markedly. This stage of shock can be recognized by the presence of hemoconcentration. A progressive decline in the blood pressure signifies that compensation is failing and that the end is near. It is a sign of departed opportunity.
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> Capillary atony in extensive areas reduces both the total and the effective blood volume and leads to the reduction of the volume flow. This reduces the delivery of oxygen to the tissues. When the supply of oxygen falls below physiologic limits, it augments the capillary atony. Moderate lack of oxygen causes dilatation and hyperpermeability of capillary walls. This effect introduces a self-perpetuating quality which operates as a vicious circle and leads to irreversible changes.

Thus it is apparent that the capillary endothelium is a most vulnerable point, and its injury may initiate or perpetuate the mechanism which results in shock. While studies of the blood pressure may be important after shock has been recognized, it is worth emphasizing that there may be "compensated shock" with the blood pressure maintained by vasoconstriction, even though hemoconcentration exists.[9] At this stage treatment is most effective, and if the condition is unrecognized, it may proceed to the dangerous stage. Strumia, Wagner and Monaghan[10] stated that the need for large doses of plasma could be avoided by the use of smaller amounts earlier.

The pathologic physiology[8c] of shock is reduced total blood volume, volume flow, basal metabolism, oxygen content, carbon dioxide combining power, chlorides and coagulability of the blood with increased red cells, hemoglobin, specific gravity, nonprotein nitrogen, and sugar and potassium content of the blood. In the early stages the flow of lymph is increased; later it may subside. The absorption of water, drugs and other substances from the gastrointestinal tract and from subcutaneous areas progressively declines. In the final stages an unremittingly low blood pressure is present.

Shock should be prevented as much as possible, and the avoidance of dehydration is an especially important factor.[2b] It has been estimated that the total amount of the secretion into the intestinal tract of an adult is about 8 liters in twenty-four hours. When it is realized that most of this secretion can be lost by vomiting and diarrhea and that the total volume of blood plasma is less than 4 liters, the importance of replacement therapy is evident.

Shock can be recognized before the fall of the blood pressure by laboratory aid. Scudder[11] pointed out that four determinations are necessary to the proper evaluation of the early stages of shock, the hematocrit reading, the plasma protein level, and the specific gravity of whole blood and of plasma. Giordano[12] advised three tests, complete blood count, the hematocrit determination and the plasma protein level. The hematocrit determination establishes the ratio of red blood cells to plasma. In hemoconcentration which accompanies shock the average normal cell volume of 46 for men and 41 for women is increased proportionately with the degree of hemoconcentration.

At this point it is well to quote further from the statement by Moon[8c] about hemoconcentration: "It seems remarkable that a phenomenon so frequent in occurrence and so gravely significant as is hemoconcentration has not been understood and utilized in their clinical studies." Hemoconcentration can be detected by an increase in erythrocyte volume shown by the hematocrit reading, by increased specific gravity of whole blood, by increased hemoglobin content and by increased erythrocyte count. An increase in any of these indicates hemoconcentration, but the degree cannot be estimated except by comparison with previous data.

The level of plasma protein is of value as a check on the hematocrit reading and furnishes evidence of either protein loss or hemoconcentration. The average normal level of the plasma protein is from 6 to 8 per cent.

While there are many factors concerning shock about which all are not in accord, it is agreed that the factors which call for treatment are the

anoxia and the decrease in the blood volume. Treatment should be directed at the removal or amelioration of the cause, and the restoration of the blood volume to normal. The chief need is the restoration of the fluid lost. Treatment therefore depends on the type of fluid lost. There are three broad groups:[1, 9] (A) shock due to dehydration in which the principle need is water and salt; (B) shock due to hemorrhage, in which blood is needed, and (C) shock due to plasma loss, for which human plasma is the best treatment. Shock caused by dehydration is characterized by severe loss of water and electrolytes. The changes in the blood are indicated by an elevation of the hematocrit reading and the plasma protein level, and usually by a fall in serum electrolytes. Shock due to hemorrhage is characterized by a fall in the hematocrit reading and a normal to low serum protein level. The third form, shock due to loss of plasma, is characterized by elevation of the hematocrit reading with a slight change in the plasma protein level. A normal plasma protein accompanied by hemoconcentration is indicative of loss of protein; therefore, plasma is the chief need. In essence, in shock of any type, an attempt must be made to keep the hematocrit determination and plasma protein level within normal limits by as frequent tests as circumstances warrant; they should be made every four hours in cases in which the patient is seriously ill.

It should be emphasized that plasma loss may be present in any type of shock and, therefore, that plasma replacement is indicated whenever it becomes necessary as shown by an increase in the hematocrit determination out of proportion to the rise in the plasma protein level. In plasma loss physiologic saline solution so commonly used is not effective. In fact, it may be harmful, as is shown by Lee, Elkinton, and Wolff,[13] and others. In the normal capillary bed arterial pressure forces water and crystalloids into tissue spaces; at the venous end of the capillary bed, where the pressure is less, osmotically active plasma proteins draw water and crystalloids back into the blood stream. This action is regulated by a delicate balance between capillary permeability, blood pressure and the osmotic pressure of plasma proteins. In shock, capillary permeability is increased, plasma protein passes into tissue spaces, and there is no return of fluid into the blood vessels; hemoconcentration and edema of the tissues result. When excessive amounts of saline are given intravenously, a temporary increase in blood volume takes place, but this additional fluid dilutes the already existing low protein concentration to the edema level. The use of plasma increases the osmotic pressure inside the capillaries and restores the fluid balance better than any other substance. Strumia, Wagner and Monaghan[10] summarized the advantages of citrated blood plasma as follows: (A) It can be readily prepared and safely transported. (B) It can be stored indefinitely. (C) It is safe and free from reactions. (D) It can be used in large and repeated doses. (E) It is ready for immediate use. (F) It does not add to the concentration of erythrocytes if this condition is present.

As anoxia is the eventual result of peripheral circulatory failure, it is evident that the use of oxygen is indicated both in the prevention and treatment of shock, as pointed out by Boothby, Mayo and Lovelace,[14] who advocated 100 per cent oxygen. Other treatment includes morphine for pain and restlessness, warmth and rest, and the use of adrenocortical extract is helpful in cases of excessive plasma loss, especially that incident to burns. Caffeine and coramine, being respiratory stimulants, may have an indirect effect that is beneficial but they are not considered as having much effect on the circulation itself.

CONCLUSION

It behooves all physicians to become "shock conscious" and to keep in mind the prevention, diagnosis and treatment of this syndrome. All patients exposed to sufficient precipitating causes, medical as well as surgical, should be considered as potential victims of shock, and the minimal manifestations should be treated immediately and adequately.

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DISCUSSION

DR. WALTER C. JONES, Miami: Dr. Arnold has ably covered the subject of shock, and I will not go into further detail in discussing it. I should simply like to talk a few minutes on surgical shock, that phase with which I am more familiar. I like to think of every surgical case as potentially one of shock. If the surgeon in treating his cases keeps in mind that the possibility of shock is always imminent, he is more on guard. In consequence the extreme degree of shock which is practically uncontrollable is not observed as often as it would be if he did not watch for it.

Dr. Arnold has brought out the importance of early recognition and adequate treatment in cases of shock.

Surgical shock is of either the primary or delayed type. The primary type of shock can be recognized and can be prevented by careful watching during the process of the operation. The early signs of primary shock in the surgical patient can be recognized by a careful anesthetist, and the condition can often be corrected by getting down to the cause of the trouble. It may be due to loss of fluid during prolonged operative procedure if there has been prolonged oozing such as occurs in breast cases with wide excision of tissue. A great deal of plasma is lost, and it may be necessary to use plasma during the operative procedure in order to combat shock as it arises.

Another frequent cause of shock in surgical patients is roughness in handling tissues and traction on vital parts. That, of course, can be prevented, but the surgical technic should be watched closely in order to handle the patient in a way to prevent trauma to the parts that are involved.

I cannot stress too much the value of a careful anesthetist in the prevention of surgical shock. If he is on guard, he can forewarn the surgeon before serious trouble arises.

The secondary type of shock or delayed shock may become evident at any time within twenty-four or thirty-six hours after the operation. Again it is necessary that the fluid balance be maintained postoperatively. I think this measure is most essential. If the maintenance of the fluid balance postoperatively is not neglected, the amount of secondary shock caused by evaporation or oozing will be greatly reduced. During the first twenty-four or forty-eight hours postoperatively the fluid level must be brought back to normal; otherwise one is flirting with the possibility of delayed shock.

In this paper Dr. Arnold has shown definitely that the fluid balance cannot be brought back to normal by water and electrolytes. Delayed shock must be treated with blood plasma or whole blood in order properly to combat the condition. Electrolyte solutions often simply exaggerate the state in which the patient may be found.

I have enjoyed this paper and the privilege of discussing it. The subject of fluid balance and electrolyte balance is so extensive that a short discussion does not permit adequate presentation of it.

DR. ARNOLD (concluding): I should like to thank Dr. Jones for his discussion. The subject of shock has a number of phases, some of which are not well understood. A great deal has been learned, however, and if this knowledge is fully utilized, it will give our patients a better chance to survive. The purpose of this paper is to stimulate interest in this very important subject.

THE SULFONAMIDE GROUP IN SURGERY

FREDERICK J. WAAS, M.D.
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Control of infection, potential or already present, is a major principle of surgery. The sulfonamides used locally and systemically now outrank all chemical agents employed to combat established infection, and they reinforce asepsis in many procedures carrying the potentialities of bacterial inflammation. Sinclair and Barker[1] applied sulfanilamide tablets directly to oral wounds for treatment and prophylaxis of infection in 1937. Compound fractures were treated with local implantation of sulfanilamide crystals by Jensen, Johnsrud and Nelson,[2] who reported healing without infection in their series of cases. The local use of the drug is the privilege of the surgeon who can apply the chemical at the most needed point, obtaining the highest concentration at the front line of the defense. With sulfanilamide, a concentration of 800 milligrams per hundred cubic centimeters may be secured at the source of the infection, and with the simultaneous addition of sulfathiazole a further concentration of this less soluble drug occurs up to approximately 200 milligrams. These chemicals have a bacteriostatic effect on most of the pyogenic organisms encountered in surgery. Practical experience has shown the higher concentrations of the locally applied drugs have greater bacteriostatic effect than do the usual blood levels of oral administration. Except for the minor disadvantages of increased bleeding and serum formation, there have been no ill effects from the local use of sulfonamides.

In the 100 consecutive surgical cases of our series the drugs were applied locally whenever possible and also were given systemically by oral and parenteral routes. In 97 of these cases sulfanilamide or sulfathiazole, or both drugs were applied to the wounds. The dry powder was sprinkled about the surface of the wound so that a thin layer was formed as uniformly as possible on all surfaces. An amount sufficient to form this thin layer only was used; no large masses were allowed to remain. In cases of abdominal infection 5 Gm. of sulfanilamide mixed with 5 Gm. of sulfathiazole was used in the treatment of the average 150 pound adult, two thirds of the mixture being placed within the peritoneal

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cavity and one third in the incised wound. Early in the series, 18 Gm. of sulfanilamide was used in the treatment of patients with perforating peptic ulcer and perforating appendicitis. Except for extreme cyanosis, no ill effects were noted, but this amount was probably greater than was needed.

The drugs were prepared for use by placing a measured amount in a sterile, wide mouth glass bottle, which was autoclaved with its contents for fifteen minutes at 10 pounds of pressure. The container was corked tightly to prevent absorption of moisture and resulting caking of the crystals. Caking is usually more evident with sulfanilamide than with sulfathiazole because of the greater solubility of sulfanilamide. If conglomeration of the crystals occurs, the masses should always be broken up into powder before use in the body. Mueller[3] recommended sterilization by dry heat for two hours at 140 C. This method should be more satisfactory than autoclaving because it eliminates moisture. We do not have access to the properly controlled dry heat, and our attempts at this type of sterilization have resulted in destruction of the drug because of excessive heat. The reason for sterilization is to destroy the bacteria on the outside of the bottle and in the wrappings so that the container can be handled at the operating table. Autoclaving of a tightly corked bottle does not allow penetration of steam into the bottle, and there is little if any action upon the drug.

The sulfonamides were used parenterally in the treatment of 28 cases. Sulfanilamide in an 0.8 per cent solution of normal saline was used for hypodermoclysis in 5 cases. The present practice is to use a 0.5 per cent solution of sodium sulfathiazole in normal saline for this purpose. Five grams of sodium sulfathiazole is dissolved in 1,000 cc. of normal saline. A higher concentration should never be used for injection beneath the skin because the extreme alkalinity is likely to cause sloughing. Nothing but transient soreness resulted from the repeated use of a 0.5 per cent solution of sodium sulfathiazole in 23 cases. The injection of 500 cc. of this solution every eight hours until a total of 1,500 cc. containing 7.5 Gm. of sodium sulfathiazole has been administered, insures a blood level of 3 to 5 mg. in the average 150 pound adult receiving a total of 3,500 cc. of fluids in twenty-four hours.

In the greater number of the cases of this series infection was established at the time of the surgical procedure (table 1). Infection was a potential threat in 21 cases and the use of sulfonamides in these cases was experimental. The extremely successful results obtained in traumatic wounds and in anastamosis of the bowel, as the four gastric resections, were gratifying. In large, extensive surface wounds, exemplified by the radical mastectomy, the increase in bleeding and serum formation was striking. We have discontinued the use of the chemicals in such wounds.

TABLE 1.—DIAGNOSES IN 100 CASES

Appendicitis		29
Acute suppurative and gangrenous	16	
Perforating with peritonitis	8	
Perforating with abscess	4	
Traumatic with hematoma of omentum and contused parietal peritoneum	1	
Duodenal Ulcer		6
Perforating	2	
Perforating with abscess formation	1	
Other complications	3	
Cancer of Stomach		1
Traumatic Intestinal Perforation		2
Subacute Cholecystitis with Cholelithiasis		2
Gangrenous Ovarian Cyst		1
Inguinal Hernia		3
Major Burns		12
Mesenteric Lymphadenitis		2
Suppurative Inguinal Adenitis		2
Carcinoma of the Breast		3
Deep Abscesses		13
Brodie's of humerus	1	
Traumatic subperiosteal with pyemia	1	
Leg with pyemia	1	
Hand	6	
Others	4	
Cellulitis		4
Facial	2	
Pelvic	1	
Lower extremity	1	
Multiple Extensive Lacerations Including Tendon and Hand Injuries		12
Puncture Wound of the Lung with Pneumonitis		1
Infected Cysts		2
Compound Fractures		3
Open Reduction of Fractures		2

The primary closure and healing of infected wounds through the use of these drugs is of special interest. A small appendiceal abscess was obliterated by removing the pus by suction and removing the gangrenous appendix. After application of sulfanilamide and sulfathiazole the wound was closed without drainage. A Brodie's abscess of the humerus was evacuated, sulfonamides were applied, and the wound was closed tightly. Two wounds through which supperative lymph nodes were excised were closed without drains. In these 4 cases the patients recovered without the slightest signs of continued infection, and the wounds have remained solidly healed. Other appendiceal abscesses were treated by using

drainage because of the widespread infection present and the uncertainty of complete removal of infected tissue. It is only the unusual abscesses which can be cleared away without soiling, and in most cases of this type there should be continued drainage.

TABLE 2.—OPERATIONS

Appendectomy	30
Drainage, appendiceal abscess	1
Closure, perforating peptic ulcer	2
Drainage, subdiaphragmatic abscess	1
Gastric resection	4
Closure, traumatic intestinal perforations	2
Cholecystectomy	2
Hernioplasty	3
Excision of infected cyst	3
Debridement, burns	12
Excision of suppurative lymph nodes with primary closure	2
Radical mastectomy	3
Incision and drainage	12
Repair of lacerations, including tendons	12
Debridement, compound fractures	3
Open reduction fractures	2
Osteotomy and drainage of Brodie's abscess	1

SUTURES

Cotton	47
Chromic catgut	28
Silkworm gut	1

TABLE 3.—BACTERIOLOGY IN 48 CASES

Staphylococcus aureus	16
Staphylococcus hemolyticus	1
Streptococcus hemolyticus	4
Bacillus coli	15
Bacillus coli and Staphylococcus	1
Bacillus coli and Streptococcus hemolyticus	1
Bacillus coli and Streptococcus fecalis	1
Bacillus welchii	1
Bacillus welchii and Bacillus pyocyaneus	1
No growth	7

TABLE 4.—METHODS OF ADMINISTRATION

	Sulfathiazole	Sulfanilamide
Local	44	56
Oral	75	8
Parenteral	23	5

AVERAGE BLOOD LEVELS

	Sulfathiazole Milligrams	Sulfanilamide Milligrams
First Day	4.5	6
Second Day	5.9	8.2
Third Day	4.8	12.5
Fourth Day	4	8.6
Fifth Day	4.1	7.5
Sixth Day	3	
Seventh Day	4.5	
Eighth Day	3	

TABLE 5.—SULFONAMIDE REACTIONS

Nausea	40
Nausea and vomiting	9
Cyanosis	7
Chills	5
Fever	12
Leukopenia and anemia	0
Hematuria (microscopic)	10
Anuria	0
Skin eruptions	3
Previously sensitized	2
Increased bleeding	8
Serum in wound	6

Specimens for aerobic and anaerobic cultures were obtained in 48 cases, and the results of culture are shown in table 3. Infection caused by the Bacillus welchii was present in 2 cases of appendiceal abscess; in both the patient recovered. A boy with staphylococcic pyemia resulting from a traumatic subperiosteal abscess died after eleven days of intensive therapy with sulfathiazole. Necropsy showed metastatic abscesses which were probably well established before the beginning of treatment.

The routes of administration and an average of the resulting blood levels are shown in table 4. A patient with peritonitis received a local application to the peritoneal surfaces at operation, hypodermoclysis of a 0.5 per cent solution of sodium sulfathiazole during the period when duodenal suction was used, and sulfathiazole administered orally when function of the gastrointestinal tract was reestablished.

Determinations of sulfanilamide in the blood were made twelve hours after peritoneal administration and before supplementary usage in some cases. Twelve to 16 Gm. of sulfanilamide used intraperitoneally caused a concentration of approximately 8 to 10 mg.

Adverse reactions to the sulfonamides were numerous and annoying, but in no instance was there a threat to life or permanent injury (table 5). All patients were seen at least twice daily, and a fluid intake which produced a urinary output of at least 1,000 cc. was strictly enforced. As a rule total and differential leukocyte counts and urinalysis were made every other day. Most patients had recovered from infection by the time drug reactions developed, and immediate discontinuance of the sulfonamides prevented severe reactions.

Two patients had been previously sensitized to sulfathiazole. An intoxicated man, with major trauma to tendons and muscles of the arm resulting from an automobile accident, received 2 Gm. of sulfathiazole locally and 6 Gm. orally during the first twenty-four hours of treatment. There developed chills with a rise in temperature to 106 F. eighteen hours after repair of the wound. He was stuporous, and a maculopapular rash appeared on his chest a few hours later. There was no infection of the wound. Withdrawal of the drug and the administration parenterally of large amounts of fluids were followed by quick recovery. In this case there was a history of sulfa-

thiazole therapy over a ten day period for gonorrheal urethritis six months previously. In the case of another patient with local peritonitis due to appendicitis the same type of reaction of milder degree developed. This patient had received sulfathiazole therapy for pneumonia eight months before.

The exact percentage of patients manifesting sensitivity to sulfathiazole is not known, but perhaps most of those having chills, fever and skin rashes during treatment are sensitized and will react promptly to any future administration. Aside from the primary reactions, this sensitization should be a strong deterrent to the use of sulfathiazole for minor and inconsequential infections. The drug is too valuable for such misuse, which may prevent its administration during treatment of a life-threatening infection.

SUMMARY

1. The sulfonamides are extremely helpful in controlling and preventing surgical infections. They may be used locally in the form of sulfanilamide and sulfathiazole crystals with excellent effect and without damage to tissue. In large extensive wounds there may be excessive bleeding or serum formation due to implantation of the crystals.

2. Sodium sulfathiazole may be administered in a 0.5 per cent solution in normal saline for the purpose of hypodermoclysis. A stronger solution cannot be used beneath the skin.

3. In the 100 cases of this series there were no severe or permanent adverse reactions.

4. Some patients become sensitized to the sulfonamides, especially sulfathiazole. The drugs should not be used except when sufficient indication exists.

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POSTPARTUM HEMORRHAGE

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The two major causes of maternal mortality, sepsis and hemorrhage, can to a large extent be eliminated by adequate prenatal care and better technic of delivery. Although sepsis leads the causes of death, hemorrhage preceding it is often an important contributing factor, and the prevention of hemorrhage will greatly decrease its incidence.

A loss of 100 to 300 cc. of blood is considered a necessary part of normal labor. The escape of a quantity in excess of that amount is considered a postpartum hemorrhage, and although patients have been known to survive a loss of 2,000 and even 3,000 cc., any quantity over 1,500 cc. should be replaced by transfusion.

Many ingenious devices have recently been perfected for measuring the amount of blood lost, the most practical of which consists of separative drains by which amniotic fluid and blood are shunted into separate containers for weighing or measuring. This apparatus is chiefly of scientific interest and is not widely available. The necessity for its use can be eliminated by preventing hemorrhage.

Nature does her part with the plethora of pregnancy (polyemia), which exists from the second trimester on. The blood volume of nonpregnant persons is usually estimated at from 1/20 to 1/16 of the body weight, and in pregnant women the estimation is raised to from 1/14 to 1/12.

An increased cholesterol content of the blood hinders the physiologic destruction of existent red blood cells, and increased nutrition facilitates the formation of new cells. Iron, being an essential constituent of hemoglobin, is especially in demand at this time and should be added to the diet from the fourth month on as there is a need of this element in both fetal and maternal metabolisms. A monthly hemoglobin determination acts as a check on the dosage, and while it is being ascertained, it is a simple matter to test the coagulation time. If it is of longer duration than five minutes, an estimation of prothrombin may be made following the technic of Quick. If the prothrombin level is between 70 and 80 per cent of normal, spinach, watercress, if available, and lettuce are added to the diet as they are the natural sources of vitamin K and subsequently of prothrombin.

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Javert and Macri[1] established that the prothrombin level is lowest in early pregnancy, probably on account of a lowered intake of vitamin K because of morning sickness, nausea and vomiting. Thereafter, its course is upward, and it is highest at term. These authors also demonstrated that the administration of mineral oil interferes with the absorption and adsorption of vitamin K in the intestine by inhibiting bacterial synthesis. They observed that it causes a profound drop in the prothrombin level, which cannot be completely counteracted by the administration of vitamin K, for a rise in the level occurs only when the oil is stopped. Mineral oil also inhibits the absorption of carotene, the precursor of vitamin A, and the fat soluble vitamins D and E; so it is not the harmless laxative the public has been led to believe.

In a series of 30 cases, in 18 of which there was a clotting time of four minutes or more, mineral oil was prohibited, vitamin K was administered by mouth during the last month of pregnancy, and at the onset of labor an intramuscular injection of thylohydroquinone, commercially known as synkamin, was given. The average loss of blood at the time of delivery was less than 200 cc., and in only one case was there a postpartum hemorrhage with a loss of 300 cc. of blood. In this case the patient was sensitive to barbiturates, and the uterus was atonic following analgesia with ether.

Vitamin K is not a hemostatic and is of value purely as a prophylactic. Its administration is ineffective, and its action is too slow for use when hemorrhage has already occurred.

Of equal importance in the prophylaxis of postpartum hemorrhage is the conduct of the third stage of labor. Without any thought of the natural mechanism, the uterus is often grabbed, violently squeezed and variously insulted in a manner that would make old Dr. Crede roll over in his grave. After the placenta has been torn loose, the entire uterus is incorrectly used as a piston to shoot the placenta out, and in many cases the fundus is left pushed down in the pelvis with consequent obstruction to venous drainage and overflow through the maternal sinuses. It is a relatively simple matter requiring little additional time to use the Pastore technic. It consists of palpating the fundus with the right hand, noting the change from a smooth discoid to a globular shape, and then with the left hand flat on the symphysis preventing prolapse into the pelvis exerting moderate pressure on the fundus and feeling the placenta slip through the lower uterine segment into the vagina, traction on the cord lifting the placenta through the vulva.

When hemorrhage occurs after a properly conducted third stage, the fundus is again a diagnostic point. If it is hard, and the uterus is well contracted, a cervical tear or a gutter type tear in the muscle is usually present. The prophylaxis of cervical tears requires no pituitrin even in minute doses to stimulate sluggish second stage pains, but rather morphine, or preferably syntropan, to soften the cervix and facilitate dilation. In the treatment of the tear a suture is placed high at its apex for control, with lower sutures loosely tied for apposition.

If the fundus is soft, and the uterus is atonic, the fault may have been the use of too much barbiturate in producing analgesia, or too prolonged anesthesia produced by ether. The treatment consists of massage first, and then later the administration of pituitrin followed by ergot, or one of the preparations containing it. For prompt action when massage does not hold the contraction, the intravenous injection of 3 drops of pitocin, the protein-free oxytocic principle of the posterior lobe of the hypophysis, is the method of choice.

There is the postpartum hemorrhage one hears about and hopes he will never see in which the uterus remains flabby and atonic with unclosed sinuses, large clots and blood gushing from the vagina as from an open faucet. For this type Timberlake[2] recommended placing ice on the abdomen, and Goodman[3] suggested introducing ice into the uterus itself. Packing is not recommended as it takes too much time and the bleeding continues ahead of the pack. Expression of the clots, massage, the application of ice and the intravenous administration of pitocin give the best results.

CONCLUSION

This is not a scientific paper. Nothing new has been presented; the brain children exhibited all have other fathers. Summarized, the contents simply state that by administering iron and vitamin K during pregnancy and by taking time and having a little respect for the uterus in the third stage of labor, an appreciable amount of maternal blood can be saved.

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WILEY M. SAMS, M.D...D-45.....*Miami*
JOE I. TURBERVILLE, M.D...A-44.....*Century*
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MEDICAL MANPOWER

In recent weeks much publicity has been given, not only on a state but on a national scale, to the existing shortage of medical care and to the fact that there is impending a still more acute shortage. Many factors have conspired to bring this issue to the fore; among them is the fact that members of the medical profession, particularly in Florida, have gone into the Armed Services in large numbers. It is probable that we have sent as large, if not a larger, proportion of doctors into the Army and Navy than any other state. This has naturally lead to a shortage of physicians in many communities and, in a few, people have been left without any medical care.

Under the original procurement and assignment registration many physicians expressed themselves as willing, if the emergency demanded, to be moved to areas within the state where their services might be needed. In spite of this, there are some communities, and there will be others, which are in urgent need of physicians. How these communities can be supplied with doctors when those practicing at home are working to their full capacity is a problem which will have to be solved.

Much criticism has been directed toward medical associations, state boards of medical examiners and others who are interested in this problem, which criticism has been based on the false premise that these bodies are obstructing rather than aiding in the solution of this problem. This accusation is certainly far from the truth insofar as the state of Florida is concerned. Arrangements have been made whereby doctors can be and are being moved into communities where a shortage exists, and every agency concerned is cooperating to the fullest extent, recognizing the seriousness of the emergency.

It would seem that before such serious charges and such inaccurate statements are made by those whose knowledge is not complete, some effort should be made to determine how far the medical profession has gone in trying to solve this problem.

The War Participation Committee of the Florida Medical Association has discussed at length ways and means by which doctors may be encouraged to move to communities where a shortage exists but there is no machinery by which such moves can be made compulsory and, as previously stated, physicians are reluctant to move voluntarily. A great deal of thought has been given to this matter by the members of our committee, and they are exerting themselves strenuously in an endeavor to accomplish the desired end.

The State Defense Council has passed a resolution whereby it is possible, on request of the Council and with the approval of the Board of Governors of the Florida Medical Association, for doctors in the United States Public Health Service to be assigned to communities where no medical care exists. In such communities the people receiving care, who are financially able to do so, will be required to pay fees in accordance with the usual charges for such services in their particular area. This arrangement is very important, inasmuch as, in the first place, it will not pauperize the people and, in the second place, it will allow a physician to go into a community and engage in the practice of medicine on a normal, competitive basis. This provision will be automatically terminated at the end of the emergency by reason of the fact that the law constituting the State Defense Council provides that that body shall be discontinued at the end of the emergency.

Arrangements have also been made whereby at the request of a county medical society certain doctors may be allowed to practice for the duration of the emergency under the supervision of the Chief of Emergency Medical Service and by special permission of the State Board of Medical Examiners. This arrangement, too, ends with the termination of the emergency.

The foregoing facts clearly show that, certainly as far as Florida is concerned, the medical

profession is cooperating. President Gilbert S. Osincup, knowing the members of the profession as he does, feels positive that our Government can depend upon them to do their full share at all times.

PROCUREMENT AND ASSIGNMENT SERVICE

A communication issued for immediate release to medical journals by the Office of War Information, War Manpower Commission, was received on October 26, and is reproduced for the benefit of our readers, at the request of Dr. Edward Jelks, Chairman of the Florida War Participation Committee:

> The Directing Board of the Procurement and Assignment Service is pleased to announce that 95 per cent of the 1942 procurement objective of medical officers for the armed forces has already been met. Toward this total a number of states have supplied more than their share of physicians and only a few states are lagging behind in their quotas. It is from these states that the additional physicians needed during the current year should come.
>
> The recruitment of such a large number of physicians in a few months is a remarkable achievement and another demonstration of the traditional patriotism and unselfishness of the medical profession. In this achievement, and particularly in those of its members who are "in service," the profession can justifiably take pride.
>
> The end, of course, is not yet. Increases in the armed forces will necessitate more medical officers and additional demands will be made upon the profession for medical services in critical war production areas. The Directing Board is convinced, however, that the physicians of this country will respond to future calls for service, whatever they may be, in the same splendid manner with which they have already volunteered for service with the armed forces.

DOCTORS IN MILITARY SERVICE EXEMPT FROM ANNUAL REGISTRATION

Doctors are not required to keep up their annual registration with the State Board of Health while they are in military service.

The Florida statutes require physicians licensed to practice medicine in Florida to register annually with the State Board of Health and pay the statutory fee of $1.00. This provision, however, does not pertain to physicians in the armed services according to an opinion received from Hon. J. Tom Watson, Attorney General, dated Oct. 3, 1942, which reads in part as follows:

> With reference to physicians licensed by the State Board of Medical Examiners . . . . serving in the armed forces of our country, it is my opinion that the annual registration with the Secretary of the State Board of Health, and the payment of the $1 fee, may be waived without affecting their civil status as practitioners of the healing art in this state.

WAR BOND SALES

The Association's Board of Past Presidents has undertaken the task of soliciting donations from the membership for the purchase of war bonds. The chairman of this Board appointed Dr. H. Mason Smith of Tampa as Chief of War Bond Sales.

One-fourth of the Association's membership is now in the Armed Services and others are leaving at the Government's call. The doctors at home are, therefore, making voluntary contributions with which the State Association is to buy war bonds and in this way keep up the annual dues of our members who are serving their country.

Dr. Smith is just in the initial stage of organizing the past presidents and their deputies as this Journal goes to press. There is every indication that this plan undertaken by the past presidents will be enthusiastically received by the membership as a whole. Every response received from the past presidents contacted the latter part of October was prompt and enthusiastic, and a contribution was received, in every letter. In next month's Journal Dr. Smith plans to have a list of the members who make contributions to the State Association for the purchase of war bonds.

ANNUAL REGISTRATION OF CHIROPRACTORS, NATUROPATHS AND CHIROPODISTS DISCONTINUED

The 1927 Act requiring annual registration of all practitioners of the healing arts is no longer operative *(Ch. 12005)*. Doctors of medicine and osteopaths are, however, still required to register under the provisions of their respective practice acts.

A communication from Hon. J. Tom Watson, Attorney General, Tallahassee, to Dr. Henry Hanson, State Health Officer, dated October 3, states:

> I have checked Chapter 12005, supra, and find that said law was not brought forward and included in the Florida Statutes 1941, and therefore is no longer operative.

This annual registration of practitioners of the healing arts has been carried on by the State Board of Health since 1927. According to the letter from the Attorney General, however, the present status of the matter is this: doctors of

medicine and osteopaths continue to register annually with the State Board of Health; the registration of other practitioners designated in the Act is discontinued.

MEETING OF ADVISORY COMMITTEE, COUNCIL FOR THE BLIND

The Advisory Committee for the Florida Council for the Blind, authorized by the Florida Society of Ophthalmology and Otolaryngology at its meeting last April, met in Tampa on August 23 and held a conference at the office of the Council with Mr. R. Henry P. Johnson, Executive Director, and Miss Elizabeth O'Malley, Supervisor of Sight Conservation. Mr. James Warren of Tampa, a member of the State Welfare Board, also was present. The members of the Committee are Dr. S. B. Forbes, of Tampa, chairman; Dr. Bascom H. Palmer, of Miami, and Dr. Charles W. Boyd, of Jacksonville.

The Committee members voted to give their services without remuneration for the duration of the war, or until such time as a single consulting ophthalmologist can be employed by the Council, and they agreed to invite other ophthalmologists to advise and assist the Council on a volunteer basis. It was further agreed that the members of the Florida Medical Association be requested to provide general physical examinations without charge and that the services of the Florida Dental Society be sought on a similar basis. The Council assumed responsibility for payment of the cost of material used, as in roentgen examinations or dentistry.

Since the funds available to the Council are meager and by no means commensurate with the needs, it was decided that the cost of hospitalization, transportation, nursing, convalescent care, medicine and glasses be given careful consideration in each individual case. It was deemed advisable to select a limited number of suitable cases for initial treatment with a view to broadening gradually the scope of the program. Of 288 cases selected by the Council as available for treatment at the present time, 132 were classified as favorable. A very large proportion are cases of senile cataract. It is of interest that Florida has more Aid to the Blind recipients in proportion to its population than any state in the Union and that the rate of increased blindness, according to a study made at the State School for the Blind, is considerably higher than for the national average.

The Committee agreed to divide the state into three sections, the members assuming responsibility for furtherance of the medical features of the sight conservation program in their respective districts. Each member will advise with the Council's supervisor of sight conservation responsible for the eye care program regarding cases in his territory and will seek the cooperation of the Society in obtaining eye examinations and corrective medical or surgical treatment for the needy residents of the state whose cases have been carefully investigated by the Council and who are presented by this state agency for examination and treatment. The Committee also agreed to assume responsibility for the medical content of the educational features of the program and to interpret the Council policy to the medical profession.

The proposed program for the Sight Conservation Department of the Council includes: study of the causes of blindness, provision for eye examinations, treatment and care for needy patients, stimulation of interest in community programs for sight conservation, dissemination of material published in the interest of sight conservation, interpretation of the function of sight saving classes and the setting up of standards for their maintenance, and the development of policies of cooperation in sight conservation with state, county and city authorities, the Florida School for the Deaf and Blind, and other agencies.

MEETING OF GEORGIA PEDIATRIC SOCIETY

The Georgia Pediatric Society will hold its annual scientific meeting in Atlanta, December 10. The afternoon session will be at the Pompeian Ball Room, Biltmore Hotel, and the evening session at the Main Auditorium, Academy of Medicine, Fulton County Medical Society.

The following speakers will appear on the program: Dr. Alexander Ashley Weech, Professor of Pediatrics, University of Cincinnati, Medical Director of the Children's Hospital Research Foundation, Cincinnati; Dr. Meredith Campbell, Professor of Urology, New York College of Medicine, New York; and Dr. Abraham Levinson, Assistant Professor of Pediatrics, Northwestern University Medical School and Professor of Pediatrics, Cook County Graduate School, Chicago.

MEMBERS IN THE ARMED SERVICES

Authorization has just been received from the War Department to publish the names and home addresses of doctors in the armed services. Previous to this time we were advised not to publish such a list. The names in the following list were secured through the secretaries of the various county medical societies. There will be changes and corrections from time to time and any error or omission should be reported promptly to the Association at Box 1018, Jacksonville.

ALACHUA

Andrews, Edwin H.....Gainesville
Cobb, Alva T..... "
Dell, J. Maxey, Jr..... "
Jennings, Lloyd H.....Starke
Murphree, Walter E.....Gainesville

BAY

Adams, Daniel M.....Panama City
Parker, Martle F..... "
Roberts, William C..... "

BREVARD

Cooke, Frank N.....Cocoa
Hay, I. M.....Melbourne

BROWARD

Blount, Robert E.....Ft. Lauderdale
Camp, Milton N..... "
Carson, Russell B..... "
Cohn, Jess V.....Hollywood
Farringer, Robert H..... "
Lovejoy, M. Austin...Ft. Lauderdale
Peavy, Henry J..... "
Pierce, Francis D..... "
Shell, Paul G..... "
Snyder, F. Leslie.....Hollywood
Sory, Curtis H.....Ft. Lauderdale

COLUMBIA

Busey, John F., Jr.....Lake City

DADE

Adler, Lawrence.....Ft. Lauderdale
Alexander, Julius.....Miami
Alexander, Lassar..... "
Allen, Ralph F..... "
Arango, Roger J..... "
Auslander, Harold P....Miami Beach
Baker, Juel M.....Miami
Barge, William J..... "
Bernstein, William H..Miami Beach
Bertram, Albert J.....Miami
Boughton, Herman.....Miami Beach
Burbacher, Charles R...Coral Gables
Burch, John E.....Miami
Capland, Lewis.....Miami Beach
Carroll, Bruce D.....Miami
Christian, William A..Miami Beach
Clark, Irving T.....Miami
Cleveland, Jack Q.....Coral Gables
Cogan, James R.....Miami Beach
Coleman, Benjamin..... "
Coplan, Milton M.....Miami
Cullipher, Edward W..... "
Dees, John..... "
DeVore, Louise..... "
Dieterich, Frederick H..... "
Dix, John W.....Coral Gables
Dowlen, L. Washington.....Miami
Dowlen, Otto S.....Miami Beach
Eichert, Herbert.....Miami
Exley, David W.....Miami Beach
Falk, Jack J..... "
Fishbein, I. Leo..... "
Fitzpatrick, Emmett T..... "
Forastiere, Roger J.....Miami
Fox, Edward F..... "
Frehling, Stanley..... "
Frobisher, H. B.....Coral Gables
Garrard, Hollis F.....Miami Beach
Goodman, Bernard..... "
Gross, Alfred..... "
Hardie, Dan, Jr.....Miami
Hewlett, Frank W.....Coral Gables
Hinton, Andrew H.....Miami
Howdon, William M..... "
Hutson, Thomas W..... "
Jenkins, Leslie M..... "
Kaplan, Saul H.....Miami Beach
Kauders, Ferdinand H.....Miami
Kells, Paul..... "
Kline, Bernard.....Miami Beach
Kuckku, Morris E.....Miami
Kupper, William H..... "
Lamar, Carlos P..... "
Lawther, Harry C..... "
LeDrew, Frederick..... "
Leonard, George N.....Miami Beach
Levin, Alfred G.....Miami
Litterer, A. Buist..... "
McElheny, Franklin..... "
McKenzie, E. Norton..... "
McKenzie, Jack A..... "
McLemore, Carl S.....Miami Beach
McLeod, Norman W., Jr.....Miami
Marion, Dominic A..... "
Martin, Marion C..... "
Maxwell, Eugene B.....Miami Beach
Meadow, Edward.....North Miami
Messner, Paul O.....Miami Springs
Milton, John D.....Miami
Mitchell, George A..... "
Mosley, R. Sam..... "
Mouradian, Albert H..... "
Nathan, David A.....Miami Beach
Nuzum, Russell K.....Miami
O'Donnell, William G..... "
Oliver, Robert M..... "
Otto, Thomas O.....Miami Beach
Owens, W. Duncan..... "
Payton, Frazier J..... "
Pearson, Julius R..... "
Pearson, R. Judson, Jr. "
Pepper, Max.....Miami
Phillips, Kenneth..... "
Pollock, Benjamin G..Miami Beach
Preston, Edwin P..... "
Putman, James H.....Miami
Quillian, Warren W.....Coral Gables
Rash, Jack O. W.....Miami
Reckson, Murray M....Miami Beach
Reese, Homer A.....Miami
Richardson, John R...Miami Beach
Robbins, Alexander..... "
Robbins, Bernard..... "
Roberts, Thomas L.....Miami
Rogers, Hunter B..... "
Salley, S. Marion..... "
Sandberg, T. D.....Coral Gables
Sappenfield, Ralph S.....Miami
Saslaw, Milton S.....Coral Gables
Scarborough, C. A.....Miami
Schwarz, M. Jandon...Miami Beach
Selevan, Sol..... "
Silverman, Harry Z..... "
Sisler, Bruce H.....Miami
Skilling, Francis C..... "
Spicer, Robert T..... "
Stannus, Donald G.....Miami Beach
Sternberg, J. Charles.....Miami
Stewart, Franz H..... "
Stewart, Joseph S..... "
Thomas, Efton J.....Miami Beach
Torrado, Rene A..... "
Travers, M. Paul..... "
Turk, John P.....Miami
Vinson, Willie J..... "
Voris, Frank B.....Miami Beach
Wallace, Albert W..... "
Walsh, Gerald J.....Miami
Weiland, Arthur H.....Coral Gables
Werblow, S. Charles.....Miami
Whelchel, Lynn W..... "
Whitmer, Kenneth S..... "
Wigdor, Meyer.....Miami Beach
Woods, Frank M.....Miami
Youmans, Corren P..... "
Zimmerman, Paul A....Coral Gables
Zivitz, Nelson.....Miami Beach

DE SOTO-HARDEE-HIGHLANDS-CHARLOTTE-GLADES

McSwain, Gordon H.....Arcadia
Martin, Leldon W.....Sebring
Simmons, S. J.....Belle Glade

DUVAL

Adams, Thomas S.....Jacksonville
Baker, Archie J..... "
Baldwin, Donald M..... "
Ball, William H..... "
Bedell, Sullivan G..... "
Borland, James L..... "
Bowen, Frederick H..... "
Boyd, Charles W..... "
Canipelli, Edward..... "
Carithers, Hugh A..... "
Croft, George W..... "
Ferrara, John D..... "
Funkenstein, Dan H..... "
Galin, Jack..... "
Gorman, John M..... "
Graves, A. Judson..... "
Haverfield, W. Tracy..... "
Hurt, Floyd K..... "
Kemp, Simon I..... "
Kendrick, M. Hayne..... "
King, Raymond H..... "
Kirk, William W..... "
Lombardo, Samuel S..... "
Lovejoy, John F..... "
McCullagh, William H.. "
Malone, Bert H..... "
Mangels, Martin, Jr..... "
Manning, William S..... "
Manson, A. Mackenzie "
Mathers, Daniel H..... "
Mendoza, Carl C..... "
Milam, Ernest B..... "
Nelson, Thomas F.....Tampa
Oberdorfer, Aaron Z.....Jacksonville
O'Dell, John C..... "
Oetjen, G. F..... "

Parks, Lorenzo L.....Jacksonville
Porter, Harry W..... "
Richards, Ferdinand..... "
Rose, Joseph ..... "
Safer, Jacob V..... "
Simmons, Eugene D..... "
Slaughter, Frank G..... "
Sompayrac, Lauren M... "
Stamps, Walker ..... "
Strumpf, Irving J..... "
Swift, Edwin C..... "
Watt, E. Clements..... "
Wattles, F. Merrill..... "
Weil, Nathan, Jr. ..... "
Weinreb, Joseph..... "

ESCAMBIA

Bell, John D. .....Pensacola
Click, Gustav N..... "
Essrig, Irving M.....Tampa
Hixon, William P.....Pensacola
McSween, John C..... "
Mellen, Noel C..... "
Morse, George W..... "
Randall, William S. ..... "
Rubin, Nathan S..... "
Stebbins, Alvin L..... "
Tugwell, Wilton E..... "
Turberville, Joe I. .....Century
Williams, William L.....Pensacola

HILLSBOROUGH

Adamo, Frank S.....Tampa
Annis, Leonard S..... "
Blackmon, Heyward J..... "
Brown, Harold O..... "
Chunn, C. Frank..... "
Cole, Herschel G..... "
Costantino, Eugene F..... "
Cowart, James T..... "
Heath, Ralph T..... "
Helms, John S..... "
Hewit, Linus W..... "
Jefferson, Curtis B..... "
Knowlton, Horace A..... "
Linz, Frank T..... "
Martin, Douglas D..... "
Mertz, R. Bradner..... "
Murphey, David R..... "
Nix, Harold G..... "
Parsons, Hugh E..... "
Rudisill, C. A..... "
Torretta, Joseph N..... "
Trice, William W..... "

LAKE

Ashton, W. Lee .....Umatilla
Bowen, Louis R.....Eustis
Bowie, Clyde F.....Leesburg
Gleason, Albert H.....Umatilla
McGuire, John F.....Clermont
Oetjen, Leroy H.....Leesburg
Wood, Will L.....Eustis

LEE

Allan, Harry L.....Ft. Myers
Clement, W. B.....Punta Gorda
Girardin, A. L., Jr.....Ft. Myers
Jennings, John L.....Boca Grande
Stead, Vergil G.....Naples
Stipe, Harvie J.....Ft. Myers

LEON-GADSDEN-LIBERTY-
WAKULLA-JEFFERSON

Clements, Merritt R.....Tallahassee
Holland, Francis T..... "
Johnson, A. B.....Jamestown, N. Y.
O'Connor, James B. .Chattahoochee

MADISON-SUWANNEE

Black, Irby H. .....Live Oak
Chappell, Frank V.....Madison

MANATEE

Wentzel, W. E.....Bradenton

MARION

Cumming, Richard C.....Ocala
Harrell, Henry L..... "
Lytle, Carl S..... "
Moore, John P..... "
Russell, Ralph E..... "

ORANGE

Anderson, Claude .....Orlando
Bichard, Phillip M..... "
Butt, Thomas C..... "
Chappell, J. Rocher..... "
Christensen, Louis N..... "
Crisler, George R. .....Winter Park
Economou, James G. .....Orlando
Gwathmey, G. Tayloe ..... "
†Hatfield, John R. ..... "
Henderson, Robert P. ..... "
Hitchcock, Edgar E..... "
Hoffmann, Carl D. ..... "
Ingram, Hollis C. ..... "
Irwin, Thomas M..... "
Jewett, Eugene L..... "
Kingsbury, Lawrence H. ..... "
Kundert, Palmer R..... "
Mathers, Fred..... "
Mitchell, William S..... "
Orr, Louis M..... "
Ramsey, Russell W. .....Winter Park
Robertson, Don C.....Orlando
Scanlon, John J.....Winter Garden
Sears, Warren H. .....Winter Park
Sessions, Raymond R.....Kissimmee
Stecher, Joseph L.....Orlando
Sutter, Leroy M..... "
Taylor, Byrne E..... "
Zieve, Sanford L..... "

PALM BEACH

Bippus, W. E.....West Palm Beach
Daly, Thomas E... " "
Dawson, G M..... " "
Derrick, C. J. ..... " "
Gill, Richard S. ..... " "
Herpel, F. K. ..... " "
James, Lorenzo, Jr..Camp Blanding
Kelly, Oscar L. .....West Palm Beach
Nieder, James R.....Delray Beach
Ombres, S. Richard .....Palm Beach
Rotter, Saul D.....Lake Worth
Sory, Bailey B.....Palm Beach
Sory, James R.....West Palm Beach
Stanley, Thomas Z. " "
Weems, William H. " "
Wilkins, William B. .....Palm Beach

PASCO-HERNANDO-CITRUS

Manley, David B. .....Zephyrhills

PINELLAS

Anderson, C. O. .....St. Petersburg
Farber, William P. ..... "
Farrington, C. L..... "
Feaster, Orion O..... "
Frederick, A. R..... "
Funk, Neil E..... "
Gable, Linwood M. ... "
Gable, N. W., Jr..... "
Grace, Angus D..... "
Groves, W. H. ..... Clearwater
Hagan, V. LeRoy..... "
Hagood, John D..... "
Harden, W. W. ..... St. Petersburg

†Deceased

Harrison, Everett M.....Dunedin
Hebard, Charles E. .....St. Petersburg
Langley, Francis H.... "
McConnell, W. H..... "
Marr, Norval M..... "
Morin, H. Gerald..... "
Needles, Robert J..... "
Owen, R. Wynn S.... "
Purcell, Thomas R..Tarpon Springs
Quicksall, J. Braden...St. Petersburg
Rogers, H. Milton..... "
Rowell, John P..... "
Rudolph, Councill C... "
Ulm, A. Hardy.....Dunedin
Whaley, F. Eugene...St. Petersburg
Wood, Rowland E.... "
Wright, Claude B..... "
Wylie, LeRoy A..... "

POLK

Annis, Jere W.....Lakeland
Barranco, Anthony J....Lake Wales
Bosworth, Joe M.....Lakeland
Clark, Samuel J..... "
Dykes, Chapman .....Haines City
Gachet, Fred S.....Lakeland
Hargrove, Julian L.....Bartow
Keramidas, T. C.....Winter Haven
Kibler, John M.....Lakeland
Lancaster, L. L.....Bartow
Martin, Emmett E. .....Haines City
Ralston, Raymond H. .....Lakeland
Tomlinson, J. Pitt, Jr. Lake Wales

PUTNAM

Bell, F. Emory.....Palatka
Gurganious, Allen P..... "

ST. JOHNS

Britt, Reddin .....St. Augustine
Norris, Hardgrove S.... "
Spencer, John ..... "
Webb, Walter D..... "

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INDIAN RIVER-MARTIN

Davey, Walter F.....Stuart
Goodwin, Hugh B., Jr.....Ft. Pierce
Hardee, E. B.....Vero Beach
Martin, Leon H.....Ft. Pierce
Robertson, James C.....Vero Beach
Stoner, Cyrus H.....Ft. Pierce

SARASOTA

Butcher, John M.....Sarasota
Hoskins, W. H.....Venice
Martin, Stanley T.....Sarasota
Matthews, A. Lamar..... "
Miller, Cecil E..... "
Patton, Sherrel D..... "
White, Millard B..... "

SEMINOLE

Barks, Orville L.....Sanford
McDaniel, Thomas F..... "
Park, Charles L..... "

VOLUSIA

Drohomer, P. A. .....Daytona Beach
Jennings, William L. " "
Jones, C. B. .....New Smyrna Beach
Lenholt, Eric H.....Daytona Beach
Myres, M. J..... " "
Reeser, Richard, Jr.. " "
Rutter, Joseph H.... " "
Setzer, Morris B..... " "
Silsby, Harry Z. New Smyrna Beach
Tribbie, Charles E.....DeLand
Wells, J. Ralston .... Daytona Beach
West, J. Richard..... " "
Whitney, Karl R..... " "

WASHINGTON-HOLMES

Watson, Francis M.....Chipley

BIRTHS, MARRIAGES AND DEATHS

BIRTHS

Dr. and Mrs. Leland H. Dame of Sanford announce the birth of a son, John Leland, on August 14.

Dr. and Mrs. Winston F. Harrison of Miami announce the birth of a daughter, Wynne Christopherson, on September 19.

MARRIAGES

Dr. Robert H. Cleveland and Miss Hannah Elizabeth Eubank of Jacksonville were married on October 10.

DEATHS

Dr. Clifford Morgan Mitchell of Sanford died on October 5.

Dr. John Hatfield of Orlando, a Major in the United States Army, died "somewhere in the Pacific" in October, of a heart attack.

STATE NEWS ITEMS

Dr. Robert McIver of Jacksonville entertained 175 doctors, honoring Dr. Elijah Tom Sellers on his 56th birthday. The party was held on the beautiful lawn at the home of Dr. and Mrs. McIver on the river in St. Nicholas Place, Saturday, October 31, from 5 to 7.

Dr. Thomas H. D. Griffitts, who retired November 1 after thirty years of service with the United States Public Health Service, was unanimously selected as director for the new health unit in Dade County at a meeting of the Board of County Commissioners held the latter part of October.

Dr. Edmund Myers, formerly of St. Petersburg, announces the opening of his offices in the Hillsboro State Bank Building, Plant City. Dr. Myers with a partner won the Open Pair Duplicate Contract Bridge Summer Championship last August at St. Petersburg.

Notice has just been received from Dr. B. T. Beasley, secretary of the Southeastern Surgical Congress, that the meeting in Louisville scheduled for March 3-10, 1943, has been canceled on account of war conditions. The publication of The Southern Surgeon, the Journal of this organization, will also be discontinued for the duration.

Dr. Henry E. Palmer of Tallahassee celebrated the fiftieth anniversary of his practice of medicine at a dinner on October 12. A host of friends were delighted to honor Dr. Palmer on that occasion.

Dr. Henry Hanson of Jacksonville, State Health Officer, was guest speaker at a meeting of the local Lion's Club, Friday, October 9. Dr. Hanson has had experience as an immunologist and epidemiologist not only in the United States but in many Central and South American countries. His talk was so interesting and so well received that by unanimous vote he was asked to continue beyond the usual time of adjournment.

Dr. Thomas C. Black of Orlando resigned from the staff of the State Tuberculosis Sanatorium to accept the superintendency of the medical division of the Western Oklahoma State Sanatorium at Clinton, Okla., on October 15.

Dr. R. D. Thompson of Orlando was elected to the Executive Board of the Southern Tuberculosis Conference at the annual meeting of that organization held in Memphis, October 5, 6 and 7.

Florida doctors attending the Venereal Disease Short Course given by the United States Public Health Service at the Medical Center, Hot Springs, Ark., October 21-24, were: Dr. Waldo Horton, Winter Haven; Dr. J. N. Patterson, Director of Laboratories, State Board of Health, Jacksonville; Dr. W. T. Sowder, Director of Venereal Disease Control, State Board of Health, Jacksonville; Dr. Sydney Olansky, Director of the Duval-Jacksonville Venereal Disease Clinic; Dr. A. I. Kernish of the Miami Venereal Disease Clinic; Dr. J. W. McMurray, Director of the Levy-Gilchrist Health Department, Williston.

CLIFFORD MORGAN MITCHELL

Dr. Clifford M. Mitchell, a resident of Sanford for the past nineteen years, died at his home on October 5, at the age of 53.

Born in Dalton, Ga., on Sept. 10, 1889, he was graduated from Emory University School of Medicine at Atlanta in 1916. During the World War he served in the Army Medical Corps, after which he resumed his practice, first at Montezuma, Georgia and then at Palatka, Florida.

Dr. Mitchell moved to Sanford in 1923 and became associated in practice with Dr. J. N. Robson.

He was a member of the Seminole County Medical Society, the Florida Medical Associa-

tion and the American Medical Association. He was also a member of the First Methodist Church of Sanford.

Survivers include his widow, Mrs. Abbie Mitchell; his mother, Mrs. O. M. Mitchell; three sisters, Mrs. J. H. Tillis of Sanford, Mrs. E. F. Noland of Adairsville, Ga., and Mrs. G. M. Roper of Cartersville, Ga.; also two brothers, Lewis R. Mitchell of Sanford and Clyde W. Mitchell of Adairsville, Ga.

COMPONENT COUNTY SOCIETIES

DESOTO-HARDEE-HIGHLANDS-CHARLOTTE-GLADES

Dr. Henry Hanson, State Health Officer, was guest and principal speaker at a meeting of the DeSoto - Hardee - Highlands - Charlotte - Glades County Medical Society, on the evening of October 13.

PINELLAS

The annual meeting of the Pinellas County Medical Society was held at the Shrine Club, St. Petersburg, Thursday evening, October 1. Dr. W. C. McConnell was installed as president for the coming year, and the following officers were elected: president-elect, Dr. J. A. Hardenbergh; first vice president, Dr. George M. Lochner; second vice president, Dr. M. E. Black; secretary-treasurer, Dr. Annette M. Feaster. Delegates and alternates to the annual convention of the State Association were also elected: delegates: Drs. W. C. McConnell, A. M. Feaster, W. M. Davis, A. L. Mills, J. A. Herring; alternates: Drs. Grace Whitford, A. J. Bieker, J. A. Bradley, C. A. Williams, H. W. Wade.

A round table discussion was held on the evening of October 16 at the home of Dr. A. S. Anderson. Dr. Anderson acted as moderator.

POLK

Dr. A. W. Newitt, director of the Bureau of Local Health Service of the State Board of Health, was guest speaker at a meeting of the Polk County Medical Society, held in Bartow on the evening of October 14. He was introduced by Dr. R. L. Hughes. The doctors met for dinner in the dining room of the Old Folks' Home, and spent the evening discussing with Dr. Newitt the county health unit which is scheduled to be opened in Polk County on January 1.

ABSTRACT DEPARTMENT

Members of the Florida Medical Association who have had articles published in out-of-state medical journals are requested to forward such journals or reprints to Box 1018, Jacksonville, for abstracting in this department.

POSTOPERATIVE HORMONAL THERAPY TO SPARE REMAINING OVARIAN TISSUE, OWENS, W. DUNCAN, MIAMI BEACH, AM. J. OBST. & GYNEC. **43**: 326-330 (FEB.) 1942.

The author realized in 1932 with, as he states, "concern and dismay" that in an appreciable and increasing number of cases it had been necessary to remove remaining ovarian tissue. He believed that in too many cases in which the patient had had a previous ovarian operation, it became necessary to reoperate and remove the remaining ovarian tissue which had become diseased. The author states that from 1932 to 1934 various operative technics were employed in an attempt to reduce the number of necessary reoperations but that "changing technique resulted in only a small decrease in the incidence of rapid and painful cystic formation in the remaining ovarian tissue." The author mentions that in cases treated by him during this three year period, 35 per cent of the patients required a secondary operation for the removal of remaining ovarian tissue.

"In the six year period, 1935 through 1940, with follow-ups through June 1941 of 57 women who lost a part of their ovarian tissue none has required subsequent operation and only 2 have shown evidence of pathology of remaining ovarian tissue. This result is attributed to the routine postoperative use of estrogenic substance."

The author originated the following treatment by which he reduced the percentage of recurring cystic degeneration of remaining ovarian tissue: "2,000 units of estrogenic substance in oil to be given intramuscularly at a single dose each week when not menstruating; first dose eight days after operation; postmenstrual dose five days after cessation of flow." This treatment is continued for six months postoperatively because in the 29 cases studied, symptoms began within the first five postoperative months.

The author attributes the reduction of recurring cysts to the postoperative use of estrogenic substance, as 40 per cent of the patients operated upon elsewhere were relieved of discomfort or pain by this method, and a secondary operation became unnecessary.

PHOTODYNAMIC ACTION OF LIME OIL (CITRUS AURANTIFOLIA), SAMS, WILEY M., MIAMI, ARCH. DERMAT. & SYPH. **44**: 571-584 (OCT.) 1941.

Oil from the peel of the Persian lime which is grown in the southeastern district of Florida has the property of inducing a localized state of hypersensitivity to solar irradiation. The degree of the reaction depends upon the concentration of the photosensitizing agent and the time of exposure to sunlight. When the reaction is severe it begins within twenty-four hours or less as an erythema and produces vesiculation, with subsequent exfoliation. Hyperpigmentation invariably follows erythema, but may be the only observed evidence of the reaction. This reaction is not an allergic manifestation, for it does not involve a state of acquired sensitivity, but takes place uniformly on any individual following topical application of the photodynamic agent and subsequent exposure to sunlight. The chemical nature of the photodynamic principle has not been determined.

This type of hyperpigmentation is similar in all respects to that observed following the application of bergamot oil (an ingredient in many perfumes) and exposure to sunlight. The hyperpigmentation produced is frequently on the hands, and so far as has been determined, does not occur from the oil of any citrus fruit other than the Persian lime (citrus aurantifolia).

EFFECTS OF PREFRONTAL LOBOTOMY ON DEPRESSED PATIENTS, WORCHEL, PHILIP, AND LYERLY, J. G., JACKSONVILLE, J. NEUROPHYSIOL. **4**: 62-67, 1941.

This paper is based on a follow-up study of the more extended and permanent effects of prefrontal lobotomy performed for severe depression states. By studies of the emotional tone after operation, the subsequent course of the emotional tone, the intellectual changes, deterioration and analysis of individual test items, "free association," delusions and hallucinations, personality changes, and the difference in results obtained by right and left prefrontal lobotomy, the following summary of the effectiveness of the procedure is made:

"We note a definite heightening of the emotional tone. The subsequent course of this emotional change varies but there is a tendency to remain above the level of depression that char-

ON THE ALERT

★

AS THE layman sees it, the medical man is constantly on the alert for symptoms which will help him readily diagnose a patient's ailments, thus enabling him more readily to start treatment for effective cure.

Similar to the doctor is the bank official. He must be ever on the alert in placing financial aid where it is justified and be able to diagnose the borrower's needs in a way that will help him, and in no way jeopardize the depositors' money.

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acterized the patients prior to the operation. The psychometric tests did not reveal any significant changes in the intellectual abilities."

The authors caution that the small number of cases reported, the lack of a control group, and the difficulties inherent in objectively defining social recovery make any definite conclusions as to the efficacy of the operation unwarranted at this time.

ADVERTISERS' NOTES

TO CLIENTELE AND FRIENDS OF SURGICAL SUPPLY CO.

We are engaged in a terrible war to protect our freedom and liberties. This effort involves a price, a part of which we must all pay.

We have lost the services of approximately one-fifth of our trained personnel into the armed services of our government. We have lost others, as have many civilian businesses, into essential war effort industries. We may probably lose more.

Due to the uncertainties that these problems present to us, we find it necessary to close, for the duration, our Orlando branch, located at 33 East Pine Street. As before, we will continue to serve from our main offices in Jacksonville.

We look forward to returning when it's all over, and we anticipate with pleasure the continued privilege of serving those of you who have made our stay so happy and successful.

AGAR AND THE WAR

The war has cut off importations of agar-agar, which normally come from Japan. The War Production Board has frozen all stocks of agar in order to protect the requirements for bacteriologic culture medium use of the Army, Navy and civilian hospitals and laboratories.

This W.P.B. control of agar stocks made it necessary for Mead Johnson & Company to discontinue the manufacture of "Pectin-Agar in Dextri-Maltose," a product which has been used by the medical profession for the treatement of diarrhea in infants.

Fortunately, Mead Johnson & Company have another product, Casec, which gives good results for the same purpose. Physicians who are not familiar with Casec are invited to write for samples and descriptive literature to Mead Johnson & Company, Evansville, Indiana.

CONTINUOUS CAUDAL ANESTHESIA IN OBSTETRICS

A new method for continuous or fractional caudal anesthesia has been developed by Edwards and Hingson (Am. J. Surg., 57:459 (September), 1942). It appears to be remarkably effective and yet retains the complete cooperation of the patient. There has been uniform absence of delirium, narcosis, cyanosis, nausea vomiting, and anoxemia, and no interference with uterine contractions. Every infant in the authors' series breathed spontaneously except one stillborn known to have been dead several days before delivery.

The technic consists in the injection of an initial dose of 30 cc. of 1½ per cent solution of 'Metycaine' (Gamma-(2-methyl-piperidino)-propyl Benzoate Hydrochloride, Lilly) followed at thirty or forty minute intervals with 20 cc of the 1½ per cent solution. In every case there has been complete freedom of pain and discomfort of

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active labor within five minutes following the initial dose. Episiotomy and outlet forceps, and repair of the episiotomy has been without pain. The average duration of anesthesia has ranged from four and three-quarters to thirteen hours.

One patient described was having eclamptic convulsions when admitted, with blood pressure 220/110. After the initial dose of 'Metycaine' was given, the pressure declined to 140/90 and the clinical picture improved remarkably. The anesthetic was continued throughout the day without the blood pressure exceeding 150. She delivered a healthy baby spontaneously thirteen hours after the initial dose.

SQUIBB PUTTING ENTIRE LINE OF DRY PACKS IN "WAR-TIME CONSERVATION CONTAINERS"

To save several million pounds a year of war-needed metals, E. R. Squibb & Sons, New York, are now redressing their entire line of dry packs in cardboard packages. Already Squibb Epsom Salt and Squibb Sodium Bicarbonate are on dealers' shelves and in consumers' medicine cabinets in the new containers, and the rest of the products are coming on the market as fast as the laboratories can turn them out. Across the top of each package is a sealing band which reads: "War-time Conservation Container—The Priceless Ingredient of Every Product Is the Honor and Integrity of Its Maker."

In appearance, the new containers are almost identical with the former metal ones. Same colors, same label, same design. Made of especially treated paper, they are lined with chipboard and the product itself is sealed in a waxpaper or cellophane bag. This arrangement makes the packages dirt-proof, moisture and vapor resistant, and gives protection against light and heat.

Light in weight, yet sturdy, the new Squibb containers are easy to handle both in the store and in the home, and some consumers have already reported them much easier to open than many of the pre-war metal ones which were sometimes a hazard to fingernails and fingertips.

There will be no change in price in the redressed items, Squibb states, in spite of the fact that in some cases the new containers cost more to produce than the former metal ones.

AO WORKERS SALUTED

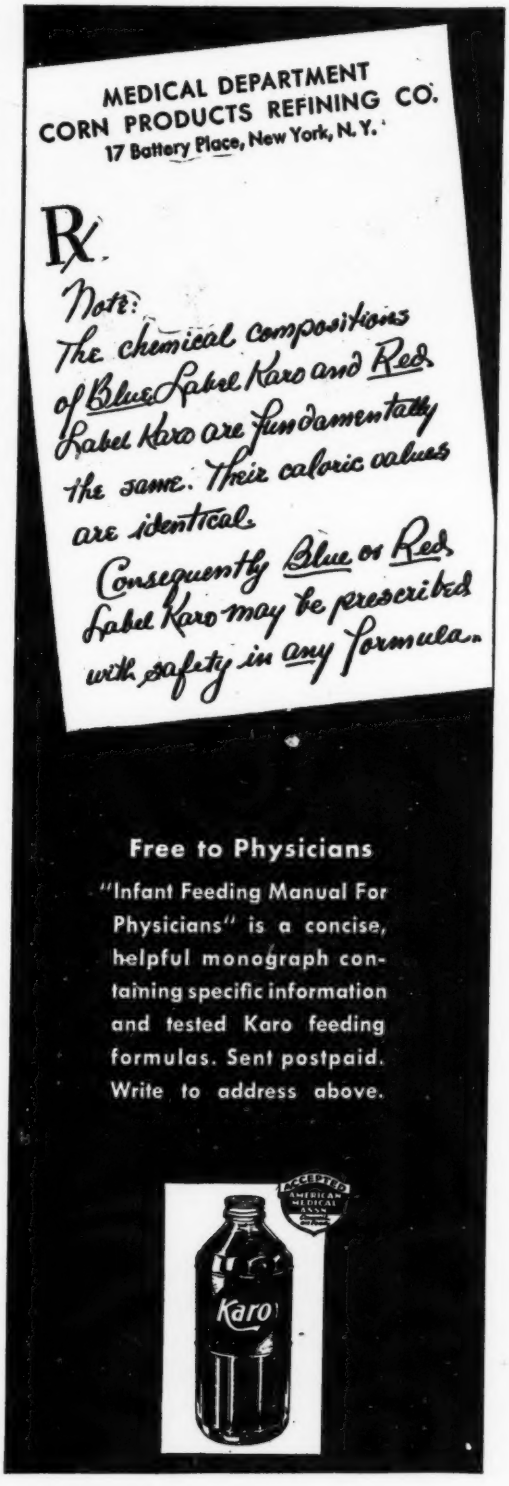
In honor of their invaluable contributions to the war effort, employees of American Optical Company and its scientific instrument division, Spencer Lens Company of Buffalo, N. Y., were saluted over radio station WOR, New York, on Wednesday morning, November 4, at 5:05 to 5:30 A.M.

Directed by Jerry Lawrence, well-known radio performer, and sponsored by the National Association of Manufacturers, the program was entitled, "Music To Work By." It consisted of recorded music interspersed with announcements referring to plants engaged in war production in the area served by WOR.

The morning of November 4 was reserved for a salute to AO. Included in the script were the following announcements:

"'MUSIC TO WORK BY' this morning salutes the American Optical Company of Southbridge, Mass., its branches in principal cities of the United States and Canada, and its scientific instrument division, Spencer Lens Company of Buffalo, where thousands of expert optical craftsmen are busily producing vital military optical equipment needed by our Army and Navy . . .

"You have just heard 'Music to Work By' which saluted the workers of the American Optical Company who are working night and day manufacturing precision optical products to protect and sharpen the eyes of Uncle Sam's soldiers, sailors and fliers—and to guard the eyesight of workers producing munitions of war for them."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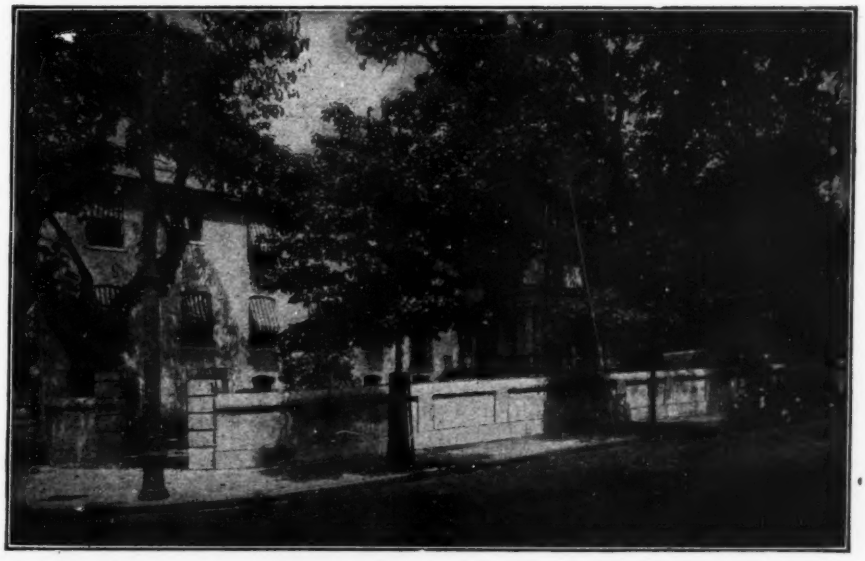

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DUVAL COUNTY AUXILIARY

The Woman's Auxiliary to the Duval County Medical Society held its Fall meeting at the home of Mrs. B. A. Chapman, 1863 River Road, on Thursday afternoon, October 1. Mrs. S. M. Copeland, Mrs. H. F. Horne and Mrs. C. W. Johnston served as co-hostesses.

Dr. Henry Hanson, State Health Officer, who recently returned from South America where he served as advisor to the governments of Peru, Bolivia, Equador and other countries, gave an interesting talk on "South American Plagues."

The president, Mrs. J. W. Hayes, extended greetings and a cordial welcome to the wives of doctors in the service.

The Auxiliary voted a contribution to the W. P. A. Nursery, upon recommendation of the Philanthropic Chairman, Mrs. John H. Mitchell. Plans were made for a supper to be given for service men at the WJAX recreation center. The supper will be under the direction of Mrs. Charles Henley and her committee.

Reports from other chairmen indicate an active program for the coming year. Officers of the Auxiliary are: president, Mrs. J. W. Hayes; vice-president, Mrs. E. W. Veal; secretary, Mrs. L. M. Wachtel; treasurer, Mrs. G. H. Ira.

Committee chairmen: social, Mrs. V. A. Hughes; philanthropic, Mrs. J. H. Mitchell; legislation, Mrs. L. Y. Dyrenforth; exhibit, Mrs. John F. Lovejoy; Bulletin, Mrs. John Owens; Hygeia, Mrs. A. F. Caraway; public relations,

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Pictured above—*Spencer Sacro-iliac Support for women. A pad is held snugly against sacrum by means of flat bands that encircle pelvic girdle inside garment and merge outside.*

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Mrs. S. M. Copeland; historian, Mrs. Charles Mabry; parliamentarian, Mrs. Gordon H. Ira; publicity, Mrs. D. E. Harrell; defense, Mrs. S. R. Norris and Mrs. Charles Henley.

In this, a war year, the fullest cooperation of all members is necessary in order to further the plans and program of the Auxiliary. Following the business meeting refreshments were served by the hostess committee and a pleasant social hour was enjoyed.

BOOKS RECEIVED

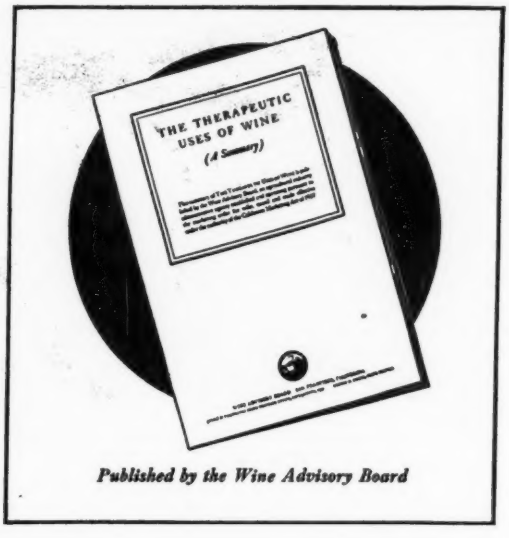
Acknowledgment of books received will be made in this column and this will be deemed by us a full compensation to those sending them. A selection will be made for review as expedient.

DOCTORS OF THE MIND. By Marie Beynon Ray. Less than seventy years ago one of the great surgeons said that the brain "will forever be shut from the intrusion of the wise and humane surgeon." Today, Marie Beynon Ray writes of the men who dared encroach upon the forbidden ground of the mind and who brought to medicine a new science of healing and a new life to many thousands once doomed to a life of mental suffering. Mrs. Ray is the author of "Two Lifetimes in One." With a pen as incisive as a surgeon's scalpel she brings into dramatic relief the battles of the pioneers of psychiatry as they worked with infinite caution in the shadowy caverns of the human mind. Cloth. Price $3.00. Pp. 335. Boston: Little, Brown and Company, 1942.

WAR MEDICINE. Edited by Winfield Scott Pugh, M.D., Commander, U.S.N. Retired. This book is a symposium covering three general headings: surgery, aviation and naval medicine, and general medicine. Cloth. Price, $7.50. Pp. 565, with illustrations. New York: Philosophical Library, Inc., 1942.

CENTRAL AUTONOMIC REGULATIONS IN HEALTH AND DISEASE. By Heymen R. Miller, M.D., Associate Attending Physician, Montefiore Hospital, New York. Some of the stimulating problems treated in this work: Central influence on sugar metabolism, obesity and urea regulation; clinical application. Mechanism of sleep and clinical import. Renal and central factors in edema, diabetes insipidus and other forms of polyuria. Central controls of reproduction and of other endocrine functions. The simulations of cardiorespiratory and abdominal disease; the difficulties in diagnosing these conditions analyzed on the basis of autonomic functions. Brain tumors masquerading as acute appendicitis. Cardiac pain and the theory of anoxemia in relation to the autonomic nervous system. The pharmacodynamics of the autonomic nervous system. The anatomy of the hypothalamus and its fiber connections. The "centers" in the cortex, hypothalamus, midbrain, medulla and pons and their influence on various systems of the body in health and disease. Cloth. Price, $5.50. Pp. 440, with 64 illustrations. New York: Grune and Stratton, Inc., 1942.

THE MIND AND ITS DISORDERS. By James N. Brawner, M.D., Medical Superintendent, Brawner's Sanitarium, Smyrna, Ga. Part I is devoted to a brief description of mental reactions as related to cerebral functions. Part II is devoted to the etiology, symptomatology and treatment of the psychoses. The grouping of these disorders is simple and corresponds to some extent with that recommended by the American Psychiatric Association. In Part III will be found a brief description of the neuroses and psychoneuroses. In Part IV is given a brief description of related subjects. Fabrikoid. Price, $3.50. Pp. 228, with illustrations. Atlanta, Ga.: Walter W. Brown Publishing Company, 1942.



Published by the Wine Advisory Board

THE THERAPEUTIC USES OF WINE

(mailed free upon request)

There has developed an interest within the medical profession that the true physiologic and therapeutic uses and deficiencies (and also the food values) of wine be authoritatively reviewed. Such a review has been prepared in monograph form by qualified and competent medical authorities and constitutes a summary of the pertinent scientific literature of present-day medicine.

The contents include sections on wine as a food, and the actions of wine on the gastro-intestinal system, the cardio-vascular system, the genito-urinary system, the nervous system and the muscles, and the respiratory system. The uses of wine in diabetes mellitus, in acute infectious diseases and in treatment of the aged and convalescent are also discussed. The value of wine as a vehicle for medication is dealt with, and an important section on the contraindications to the use of wine is included. An extensive bibliography is presented for those who may wish to pursue the subject further.

This review results from a study supported by the Wine Advisory Board, an agricultural industry administrative agency established under the California Marketing Act, and has been sponsored by the Society of Medical Friends of Wine.

Members of the medical profession are invited to write for this monograph. Requests should be made to the Wine Advisory Board, 85 Second Street, San Francisco.

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PATRONIZE JOURNAL ADVERTISERS

OUR ADVERTISERS BEAR THE STAMP OF APPROVAL OF THE AMERICAN MEDICAL ASSOCIATION AND ALSO OF THE FLORIDA MEDICAL ASSOCIATION. THEY ARE WORTHY OF THE PATRONAGE OF OUR MEMBERS.

STATE AND SECTIONAL MEETINGS

SOCIETY	PRESIDENT	SECRETARY	ANNUAL MEETING
Florida Medical Association	Gilbert S. Osincup, Orlando	Shaler Richardson, Jacksonville	To Be Announced
Florida Medical Districts:			
A—Northwest	Courtland D. Whitaker, Marianna	Stewart Thompson, Jacksonville	Tallahassee, Postponed
B—Northeast	L. Y. Dyrenforth, Jacksonville	" " "	Ocala, Postponed
C—Southwest	Edgar Watson, Lakeland	" " "	Sarasota, Postponed
D—Southeast	William Y. Sayad, W. Palm Beach	" " "	Miami, Postponed
Alabama Medical Association	H. B. Searcy, Tuscaloosa	D. L. Cannon, Montgomery	Birmingham, Apr. 20-22, 1943
Georgia, Medical Assn. of	James A. Redfearn, Albany	E. D. Shanks, Atlanta	Atlanta, May 11-14, 1943
Florida—			
Section, Am. College Phys.	R. H. Knowlton, St. Petersburg	Kenneth Phillips, Miami	To Be Announced
Dental Society, State	I. W. Shields, Miami	W. P. Wood, Jr., Tampa	Tampa, Nov. 9-11, 1942
Derm. and Syph., Soc. of	Wiley M. Sams, Miami	Lauren M. Sompayrac, Jacksonville	To Be Announced
East Coast Medical Association	T. C. Kenaston, Cocoa	I. M. Hay, Melbourne	Melbourne, 1942
Hospital Association	Mr. Ernest G. McKay, Tampa	Mr. R. L. Martin, St. Petersburg	Tampa—Postponed
Industrial Surgeons, Assn. of	Frank D. Gray, Orlando	Richard H. Walker, Orlando	To Be Announced
Medical Postgraduate Course	Turner Z. Cason, Jacksonville	Chairman	
Nurses Association, State	Mrs. Ann Thompkins, Leesburg	Miss Madalie Hazel, St. Petersburg	
Ophthal. & Otol., Soc. of	Shaler Richardson, Jacksonville	C. E. Dunaway, Miami	To Be Announced
Pathological Society	L. Y. Dyrenforth, Jacksonville	Iva C. Youmans, Miami	To Be Announced
Pediatric Society	Ludo von Meysenbug, Daytona B.	Robert Blessing, Ft. Lauderdale	To Be Announced
Pharmaceutical Association, State	Mr. Emmett L. Brown, Palatka	Mr. R. Q. Richards, Ft. Myers	
Public Health Association	W. H. Pickett, Jacksonville	Lloyd N. Harlow, Jacksonville	Miami, Dec. 7, 8, 9, 1942
Radiological Society	John N. Moore, Ocala	Walter A. Weed, Orlando	To Be Announced
Railway Surgeons' Association	Frank D. Gray, Orlando	W. C. Page, Cocoa	To Be Announced
Tuberculosis & Health Assn.	Mr. E. M. Newald, Orlando	Mrs. C. R. Whitaker, Eustis	To Be Announced
Chattahoochee Valley Med. Assn.	Herbert E. White, St. Augustine	Robert B. McIver, Jacksonville	Postponed
Gulf Coast Clinical Society	G. G. Oswalt, Mobile, Ala.	C. L. Rutherford, Mobile, Ala.	Mobile, 1942
S.E. Sec., Am. Cong. Phys. Ther.	John J. McGuire, Pensacola	Kenneth Phillips, Miami	
Southeastern Surgical Congress	Alton Ochsner, New Orleans	B. T. Beasley, Atlanta	Postponed
Southern Medical Association	M. Pinson Neal, Columbia, Mo.	Mr. C. P. Loranz, Birmingham	Richmond, November 10-12, 1942
Suwannee River Medical Society	L. J. Arnold, Jr., Lake City	T. H. Bates, Lake City	Lake City, Dec. 1942

COMPONENT SOCIETIES BY DISTRICTS

	SOCIETY	PRESIDENT	SECRETARY	MEETING DATE	MEMBERS Total	MEMBERS Paid	COUNCILOR
A	Bay	J. Powell Adams, M.D. Panama City	J. O. Barfield, M.D. County Health Unit Panama City		11	10	
	Escambia *Santa Rosa	M. W. Dodson, M.D. 309 Brent Bldg. Pensacola	Alvyn W. White, M.D. 24 W. Chase St. Pensacola	2nd Tuesday 8:00 P.M.	52	51	A-1-43 C. D. Whitaker, M.D. Marianna
	Franklin-Gulf	Thos. Meriwether, M.D. Wewahitchka	J. R. Norton, M.D. Port St. Joe	3rd Tuesday Odd Months	5	4	
	Jackson *Calhoun	W. R. Wandeck, M.D. Marianna	R. N. Joyner, M.D. Marianna	2nd Tuesday 7:30 P.M.	12	100%	
	Walton-Okaloosa	A. G. Williams, M.D. Lakewood	R. B. Spires, M.D. DeFuniak Springs	3rd Thursday 8:00 P.M.	6	100%	
	Washington-Holmes	N. J. Dawkins, M.D. Vernon	B. W. Dalton, M.D. Vernon		6	100%	
B	Columbia *Baker, Hamilton	Harry S. Howell, M.D. Blanche Hotel Annex Lake City	Thomas H. Bates, M.D. Blanche Hotel Annex Lake City	1st Monday 7:30 P.M.	11	100%	A-2-44 William D. Rogers, M.D. Chattahoochee
	Leon-Gadsden-Liberty-Wakulla-Jefferson	G. H. Garmany, M.D. Midyette-Moor Bldg. Tallahassee	B. A. Wilkinson, M.D. Telephone Bldg. Tallahassee	Quarterly 3:00 P.M.	40	39	
	Madison-Suwannee	Eustace Long, M.D. Madison	E. D. Thorpe, M.D. Madison		8	100%	
	Taylor *Dixie, Lafayette	J. C. Ellis, M.D. Perry	Chas.A. O'Quinn, M.D. Perry	Last Friday 8:00 P.M.	5	100%	
	Alachua *Bradford, Gilchrist, Union	R. E. Summitt, M.D. 122 No. Pleasant St. Gainesville	Chester F. Ahmann, M.D. 1043 W. Masonic Gainesville	2nd Wednesday 7:30 P.M.	29	24	B-3-43 L. Y. Dyrenforth, M.D. Jacksonville
	Duval *Clay, Nassau	Ernest B. Milam, M.D. 508 Greenleaf Bldg. Jacksonville	T. Z. Cason, M.D., *Acting* 2033 Riverside Ave. Jacksonville	1st Tuesday 8:15 P.M.	191	100%	
	Marion *Levy	B. S. Stutts, M.D. Anderson Bldg. Dunnellon	T. Hartley Davis, M.D. 202 Commercial Bank Ocala	3rd Thursday 12:30 P.M.	29	28	
	Putnam	J. Worth Brantley, M.D. Grandin	C. M. Knight, M.D. Palatka	2nd Tuesday Even Months 7:00 P.M.	10	100%	
	St. Johns	W. D. Webb, M.D. 220 St. George St. St. Augustine	Charles C. Grace, M.D. East Coast Hospital St. Augustine	3rd Tuesday 8:30 P.M.	12	100%	
C	Brevard	G. T. von Colditz, M.D. Route 1 Cocoa	I. K. Hicks, M.D. Melbourne	3rd Wednesday	11	100%	B-4-44 Meredith Mallory, M.D. Orlando
	Lake *Sumter	H. S. Cherry, M.D. Center Hill	R. H. Williams, M.D. County Health Unit Eustis	1st Thursday 12:30 P.M.	20	19	
	Orange *Osceola	Spencer A. Folsom, M.D. 319 Exchange Bldg. Orlando	R. D. Thompson, M.D. State Sanatorium Orlando	3rd Wednesday 8:30 P.M.	89	85	
	Seminole	C. L. Park, M.D. 515 1st Nat. Bank Bldg. Sanford	Leland H. Dame, M.D. Co. Health Unit Sanford	2nd Monday 7:00 P.M.	12	100%	
	Volusia *Flagler	W. C. Pay, M.D. 221 W. Rich Ave. DeLand	R. L. Miller, M.D. 258½ S. Beach St. Daytona Beach	2nd Tuesday 7:30 P.M.	46	43	
	Hillsborough	B. W. Lowry, M.D. 1019 Citizens Bldg. Tampa	James S. Grable, M.D. 811 Citizens Bldg. Tampa	1st Tuesday 8:00 P.M.	105	102	C-5-44 Leland F. Carlton, M.D. Tampa
	Manatee	L. W. Blake, M.D. Bradenton	M. M. Harrison, M.D. Professional Bldg. Bradenton	3rd Tuesday 7:00 P.M.	14	100%	
	Pasco-Hernando-Citrus	J. T. Bradshaw, M.D. San Antonio	G. R. Creekmore, M.D. Brooksville	2nd Thursday 7:00 P.M.	13	100%	
	Pinellas	W. C. McConnell, M.D. 313 First Federal Bldg. St. Petersburg	Annette M. Feaster, M.D 166 Fourth Ave. N. E. St. Petersburg	1st and 3rd Fridays 6:30 P.M.	106	100%	
	Sarasota	O. H. Cribbens, M.D. 138 N. Link Sarasota	A. O. Morton, M.D. Commercial Court Sarasota	2nd Tuesday 8:30 P.M.	18	15	
D	DeSoto-Hardee-Highlands-Charlotte-Glades	M. C. Kayton, M.D. Wauchula	C. H. Kirkpatrick, M.D. Box 454 Arcadia	2nd Tuesday 8:00 P.M.	20	100%	C-6-43 Edgar Watson, M.D. Lakeland
	Lee *Collier, Hendry	H. Quillian Jones, M.D. 18 Leon Bldg. Fort Myers	W. H. Grace, M.D. Box 907 Fort Myers	3rd Tuesday 7:30 P.M.	17	100%	
	Polk	J. R. Boulware, M.D. Box 367 Lakeland	Edgar Watson, M.D. Box 1021 Lakeland	2nd Wednesday 1:00 P.M.	59	58	
	Palm Beach	O. B. Hazen, M.D. Comeau Bldg. W. Palm Beach	D. W. Martin, M.D. 618 Comeau Bldg. W. Palm Beach	4th Monday 8:00 P.M.	69	100%	D-7-43 William Y. Sayad, M.D. West Palm Beach
	St. Lucie-Okeechobee-Indian River-Martin	R. C. Boothe, M.D. Box 408 Ft. Pierce	Adrian M. Sample, M.D. Box 176 Ft. Pierce	3rd Thursday 8:00 P.M.	18	100%	
	Broward	Elbert McLaury, M.D. 210 Hollywood Bk. Bldg. Hollywood	O. C. Brown, M.D. 915 Sweet Bldg. Fort Lauderdale	4th Wednesday 8:00 P.M.	41	100%	D-8-44 Elbert McLaury, M.D. Hollywood
	Dade	Thomas O. Otto, M.D. 515 E. Dilido Dr. Miami Beach	Wiley M. Sams, M.D. 305 Ingraham Bldg. Miami	1st Tuesday 8:30 P.M.	343	320	
	Monroe	Harry C. Galey, M.D. 532 Fleming St. Key West	W. R. Warren, M.D. 511 Eaton St. Key West	1st Sunday 9:00 P.M.	5	100%	

*Supervise and aid until organized separately.

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[1]*Fauley, G. B.; Freeman, S.; Ivy, A. C.; Atkinson, A. J., and Wigodsky, H. S.: Aluminum Phosphate in the Therapy of Peptic Ulcer, Arch. Int. Med. 67: 563-578 (March) 1941.* *Reg. U. S. Pat. Off.

PHOSPHALJEL
Wyeth's Aluminum Phosphate Gel
PHOSPHALJEL
Wyeth's* ALUMINUM PHOSPHATE GEL
Phosphaljel is accepted for use in the treatment of peptic ulcer associated with a relative or absolute deficiency of pancreatic juice, diarrhea or a low phosphorus diet.

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